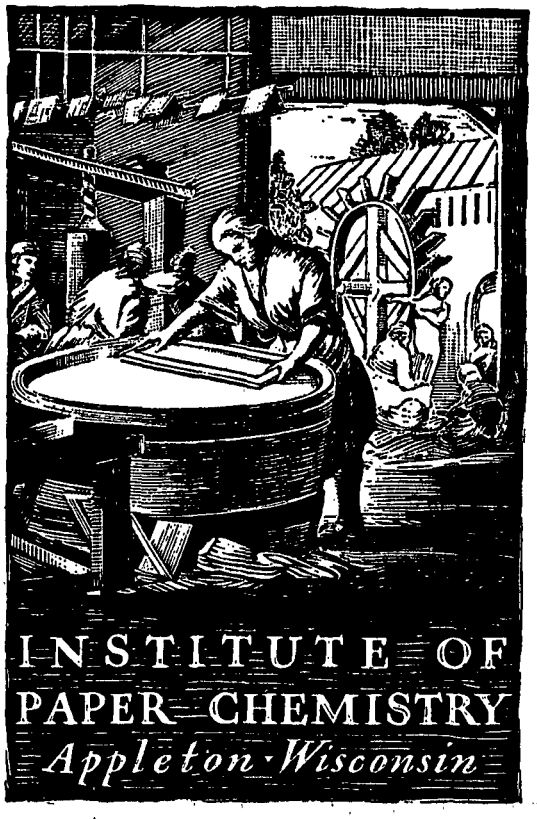


CONTINUOUS BASELINE STUDY

Project 1108-13

Summary Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1956

Your mills are identified by the following code letters in this report:

Mill	Code Letter
Jacksonville	L
Valdosta	G

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASELINE STUDY

Project 1108-13

Summary Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1956

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

This report presents a summary of the results obtained in conjunction with the Continuous Baseline Study from October 1, 1955, to September 30, 1956 --a period of twelve months--and is supplementary to a similar report dated April 1, 1956. The duration of each reported period as well as the total number of samples submitted is given in Table I, and the number of samples submitted by each mill for each of the reported periods is shown in Table II. Also shown in Table II is the total and average number of samples submitted by each mill for the twelve periods.

The current report summarizes the results obtained during the interim covered by periods 100 to 111. It may be recalled that the current F.K.I. averages for basis weight have from the inception of the Continuous Baseline Study maintained a level near 43 pounds. This same approximate level has been sustained during the period covered by this report as may be noted from the data tabulated in Table III and shown graphically in Figure 1.

With reference to the current F.K.I. caliper averages, the reader may recall that the magnitude of these averages decreased sharply from a high of 15.6 points for the inaugural period to a low of 13.4 points for the 41st period. Since that time, the caliper average has decreased gradually to its present level of 12.7 points. It may be seen from an inspection of Figure 1 that caliper has maintained a level of approximately 12.7 points for the twelve-month period covered by this summary report.

TABLE I

DURATION OF REPORTED PERIODS AND NUMBER OF 42-LB. KRAFT LINERBOARD SAMPLES PER PERIOD

Period	Duration	Number of Samples
100	October 1 through October 31, 1955	102
101	November 1 through November 30, 1955	112
102	December 1 through December 31, 1955	113
103	January 1 through January 31, 1956	113
104	February 1 through February 29, 1956	104
105	March 1 through March 31, 1956	103
106	April 1 through April 30, 1956	85
107	May 1 through May 31, 1956	98
108	June 1 through June 30, 1956	103
109	July 1 through July 31, 1956	86
110	August 1 through August 31, 1956	99
111	September 1 through September 30, 1956	81
	Average	99.9

TABLE II

TABULATION BY PERIODS OF THE NUMBER OF SAMPLES OF 42-LB. KRAFT LINERBOARD SUBMITTED BY EACH MILL

Mills	Periods 100	101	102	103	104	105	106	107	108	109	110	111	Av.
A*	--	--	--	--	--	--	--	--	--	--	1	6	3.5
B	3	3	4	5	5	1	2	2	1	2	1	1	2.5
C	2	2	3	2	3	5	3	2	5	1	1	0	2.4
D	4	5	6	6	5	4	3	5	2	6	8	2	4.7
E	4	8	10	8	10	8	8	10	6	8	6	4	7.5
F	1	7	4	0	1	1	1	1	2	1	3	0	1.8
G	6	15	10	6	11	8	6	7	7	4	6	3	7.4
H	4	6	4	5	5	4	4	2	4	5	2	2	3.9
I	6	8	6	10	8	6	4	4	8	8	12	4	7.0
J	2	4	2	3	2	3	3	2	4	2	5	4	3.0
K	6	4	6	4	6	6	6	6	6	4	2	4	5.0
L	12	2	8	11	3	4	4	8	12	2	6	6	6.5
M	6	7	8	10	9	9	8	8	8	8	8	8	8.1
N	6	11	8	7	7	10	2	6	7	4	6	8	6.8
O	16	9	12	10	9	9	9	9	9	9	9	9	9.9
P	8	8	8	8	8	8	8	8	8	8	8	8	8.0
Q	6	7	4	8	6	7	6	8	6	6	5	6	6.2
S	10	6	10	10	6	10	8	10	8	8	10	6	8.5
Total	102	112	113	113	104	103	85	98	103	86	99	81	99.9

* This mill initiated its participation in the program during the 110th period.

TABLE III

TABULATION OF CURRENT F.K.I. AVERAGES BY PERIODS

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	43.0	12.7	108	352	382
101	43.0	12.7	108	352	383
102	43.0	12.6	109	345	379
103	43.0	12.8	109	342	379
104	42.8	12.8	109	345	382
105	42.8	12.8	110	347	379
106	43.0	12.7	109	343	375
107	42.9	12.6	109	341	374
108	43.0	12.7	107	343	375
109	42.9	12.7	107	342	375
110	43.0	12.7	109	340	372
111	43.2	12.7	108	333	368

515.6

42.97

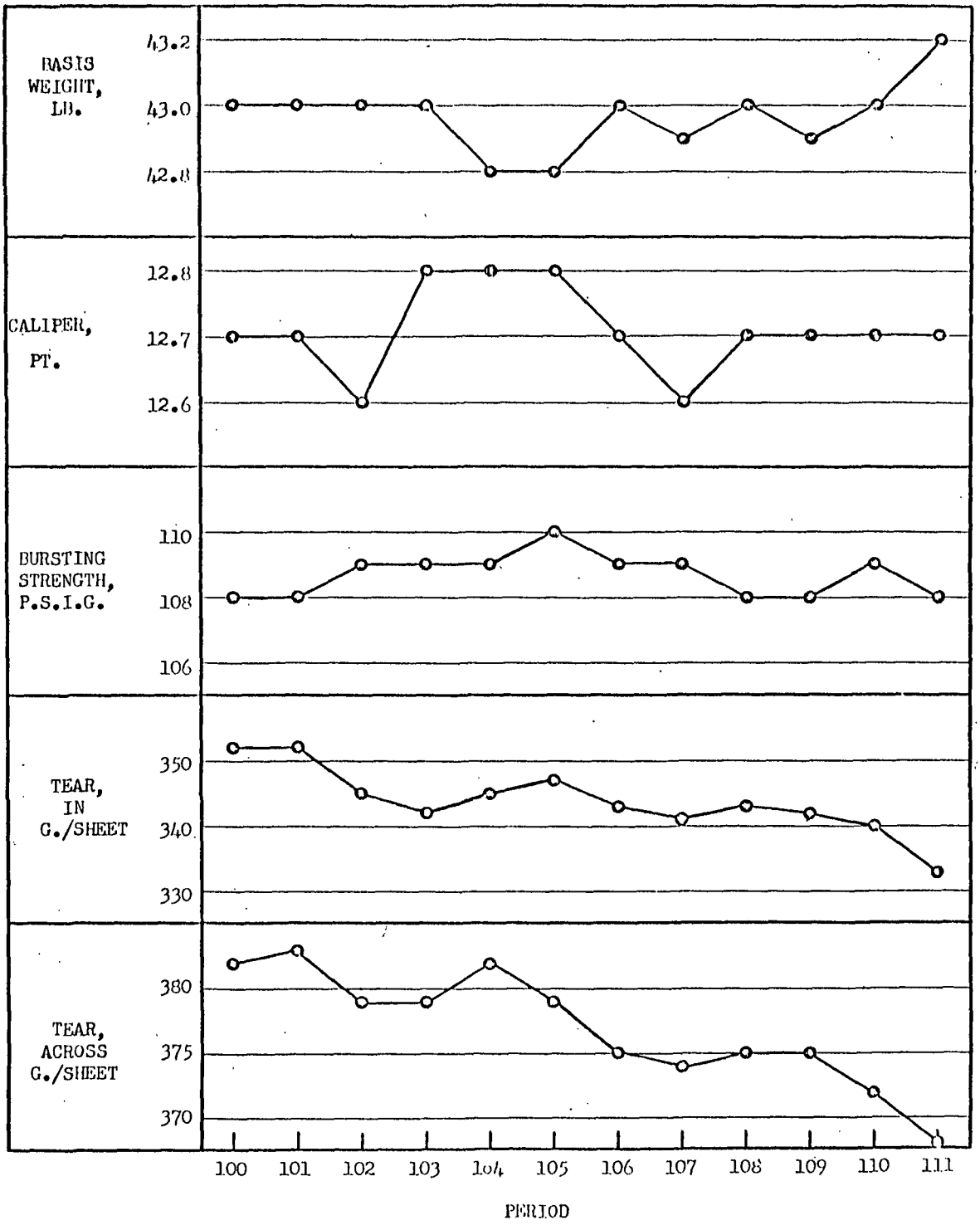


Figure 1

Comparison of Current F.K.I. Averages by Periods

The bursting strength results have exhibited no over-all trend comparable to the caliper results. A substantial increase in the current F.K.I. averages for bursting strength was evident during the first thirty-six periods of the Continuous Baseline Study. This increase was followed by a short period of decline after which the bursting strength results began to increase again and reached a maximum level of 114 p.s.i. g. during the eighty-fifth period. Since that time, the bursting strength level has been approximately 110 p.s.i. g. For the twelve-month period of this report, it may be noted from Figure 1 that the current F.K.I. averages for bursting strength have varied only slightly from a minimum of 107 p.s.i. g. to a maximum of 110 p.s.i. g.

Tearing strength, it may be remembered, was at a high level during the first thirty periods. Subsequent to the thirtieth period, a gradual decline was noted and this decline has been continuing up to the present time. It may be observed in Figure 1 that during the twelve-month period covered by this summary report machine direction tearing strength decreased from approximately 350 g./sheet to 330 g./sheet. Similarly, cross-machine direction tearing strength decreased from approximately 385 g./sheet to 365 g./sheet

In summation, the following observations may be pertinent for the twelve-month period covered by this report:

1. Basis weight has maintained a relatively constant level of 43 pounds.

2. Caliper has maintained a relatively constant level of 12.7 points.

3. Bursting strength averages have varied from a low of 107 p.s.i. g. to a high of 110 p.s.i. g. and maintained a strong level.

4. Elemendorf tear values have decreased in the machine direction from approximately 350 g./sheet to 330 g./sheet and in the cross-machine direction from approximately 385 g./sheet to 365 g./sheet.

In the remaining discussion, a brief review of the test levels maintained by each participating mill will be made. At the conclusion of the report, brief mention will be made of the over-all trends noted in the F.K.I. averages from the inception of the program to the present time.

In Table IV are presented the current mill averages for Mill A. These averages are shown graphically in Figure 2. As may be noted, results are available only for two periods and, hence, any observations on test levels would not be well-grounded.

The current mill averages for Mill B, shown in Table V and illustrated graphically in Figure 3, reveal that basis weight is currently somewhat higher than it was whereas caliper is somewhat lower. Bursting strength reached a maximum of 116 p.s.i. g. during the 106th period and then decreased to a level of approximately 105 p.s.i.g. which it is currently maintaining. Elmendorf tear, both machine and cross-machine directions, has decreased and is currently maintaining very low levels.

TABLE IV

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL A

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	--	--	--	--	--
101	--	--	--	--	--
102	--	--	--	--	--
103	--	--	---	--	--
104	--	---	--	--	--
105	--	--	--	--	--
106	--	--	--	--	--
107	--	--	--	--	--
108	---	--	--	--	---
109	---	--	--	--	--
110	42.7	12.6	117	325	353
111	43.2	13.2	109	318	355

TABLE V

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL B

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	42.4	13.6	104	346	373
101	42.3	13.7	100	331	363
102	42.7	13.6	101	331	360
103	43.8	14.4	101	336	378
104	42.6	13.5	107	330	362
105	42.2	13.1	113	331	365
106	44.2	13.1	116	307	365
107	43.1	13.3	112	336	373
108	43.8	12.9	104	356	371
109	43.7	13.8	107	333	373
110	44.0	12.7	104	307	343
111	43.2	12.8	106	301	350

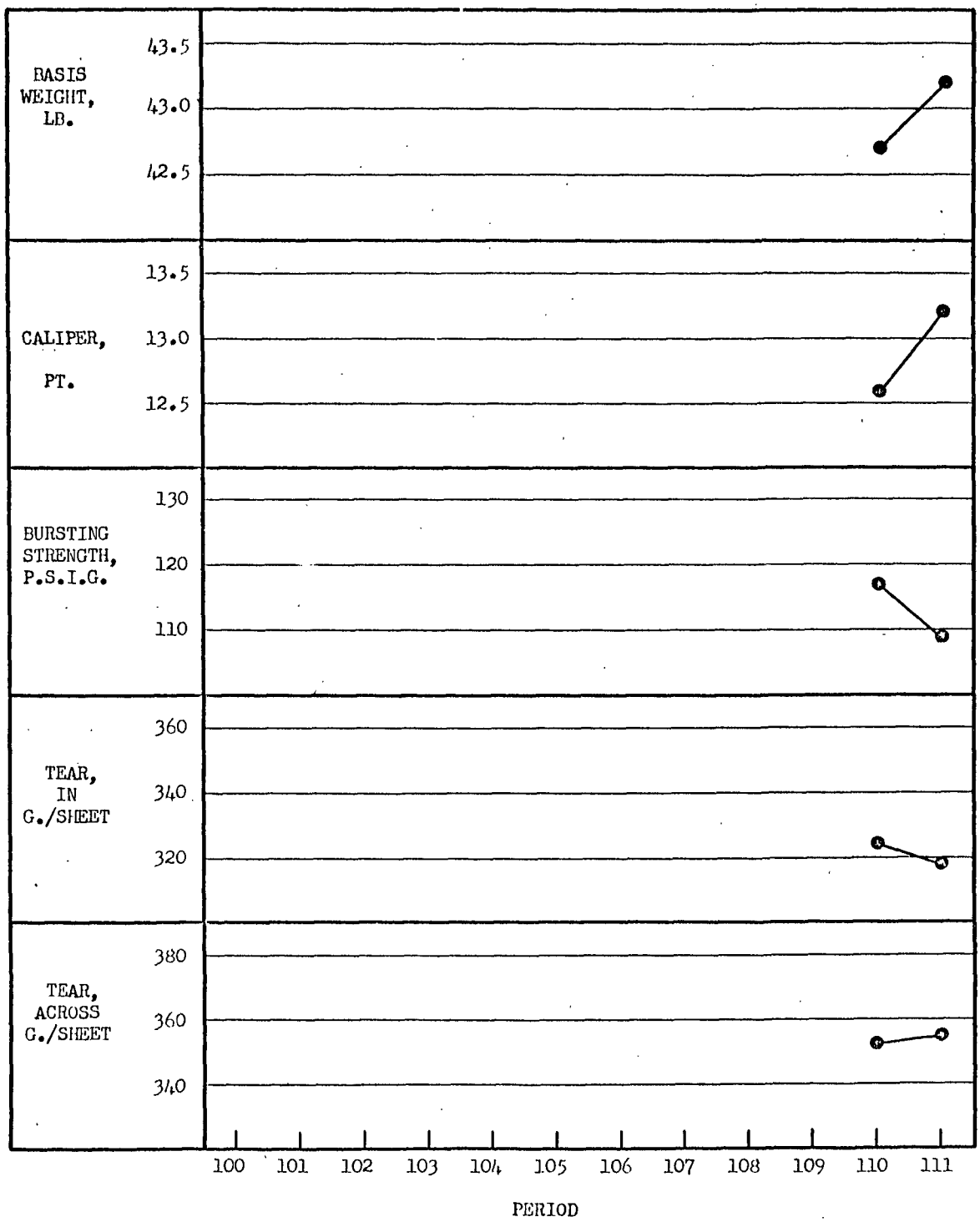


Figure 2

Comparison of Current Mill Averages by Periods for Mill A

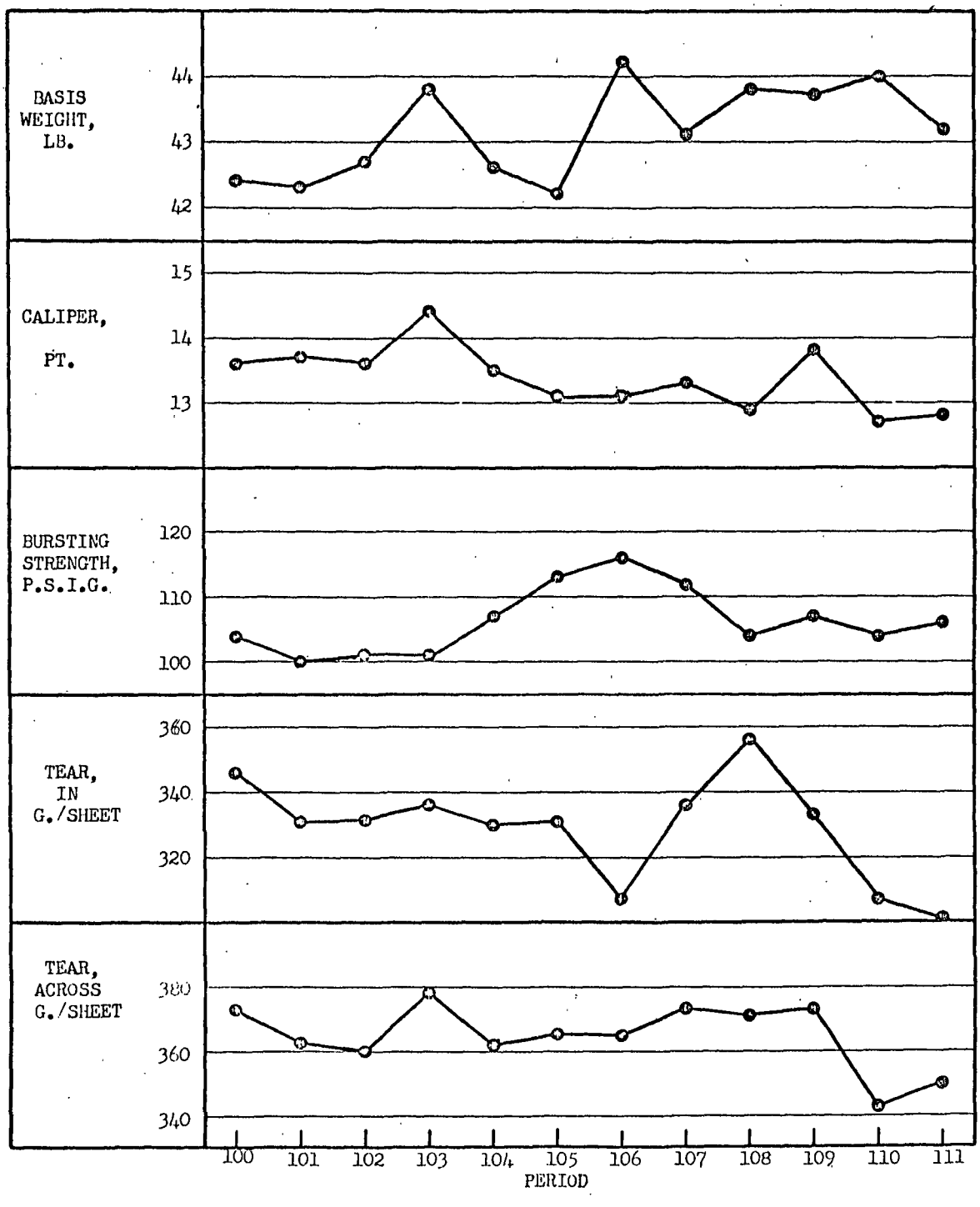


Figure 3

Comparison of Current Mill Averages by Periods for Mill B

Presented graphically in Figure 4 are the current mill averages for Mill C. These are also given in Table VI. An inspection of these results indicates that basis weight has increased somewhat whereas caliper has decreased. Bursting strength has maintained a level between 104 and 109 p.s.i.g. most of the time. Elmendorf tear decreased during most of the twelve-month period but is currently regaining some of the loss.

The current mill averages for the period covered by this report are presented in Table VII for Mill D and shown graphically in Figure 5. It may be observed in Figure 5 that no definite trends are evident. However, it may be of interest to note that this mill has maintained relatively strong and constant Elmendorf tear levels contrary to the com-- posite composite trend for all mills.

The current mill averages for Mill E are shown in Table VIII, and a graphic presentation is made in Figure 6. It may be noted from these data that basis weight has averaged slightly higher than 42.5 pounds and caliper has averaged between 12.0 and 12.5 points. Bursting strength has decreased as has Elmendorf tearing strength, both machine and cross-machine direction.

Illustrated graphically in Figure 7 are the current mill averages shown in Table IX for Mill F. From a study of Figure 7, the reader may note that basis weight has decreased and caliper has with the exception of one period maintained an average below 12 points. Bursting strength averages were generally strong with only a few exceptions.

TABLE VI

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL C

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	42.7	13.8	104	366	381
101	43.2	14.2	106	340	366
102	42.4	13.6	101	325	363
103	42.8	13.7	106	351	367
104	41.6	13.4	108	321	346
105	42.2	13.4	108	334	358
106	42.5	13.2	104	338	347
107	43.3	13.1	109	331	350
108	42.2	12.7	104	332	338
109	43.2	12.7	109	330	363
110	44.0	13.3	103	353	373
111	--	---	--	--	--

TABLE VII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL D

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	41.7	12.0	105	347	385
101	42.3	12.0	108	358	384
102	42.7	12.4	107	362	393
103	42.4	12.5	110	357	409
104	42.6	12.8	107	378	418
105	42.3	12.0	116	352	388
106	42.0	12.5	108	354	386
107	42.0	12.4	106	365	393
108	41.7	12.5	104	365	401
109	42.3	12.6	103	375	397
110	42.1	12.0	105	361	394
111	42.5	12.1	109	363	390

TABLE VIII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL E

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	42.6	12.0	112	360	374
101	42.7	12.1	107	374	398
102	42.8	12.2	112	353	385
103	42.9	12.4	113	358	389
104	43.1	12.4	107	348	389
105	43.0	12.4	105	355	387
106	42.8	12.5	107	334	371
107	42.3	12.5	107	331	369
108	42.4	12.2	109	343	384
109	42.5	12.3	106	334	379
110	42.6	12.5	107	341	370
111	43.0	12. 0	108	325	357

TABLE IX

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL F

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	43.0	11.8	112	375	402
101	42.5	11.7	108	364	379
102	42.7	11.4	112	348	376
103	--	--	--	--	--
104	42.4	11.9	121	361	418
105	42.6	13.7	114	373	407
106	42.1	11.7	107	347	381
107	42.2	11.8	115	345	382
108	42.4	11.7	104	340	371
109	42.0	11.6	104	353	375
110	42.1	11.2	110	339	371
111	--	--	--	--	--

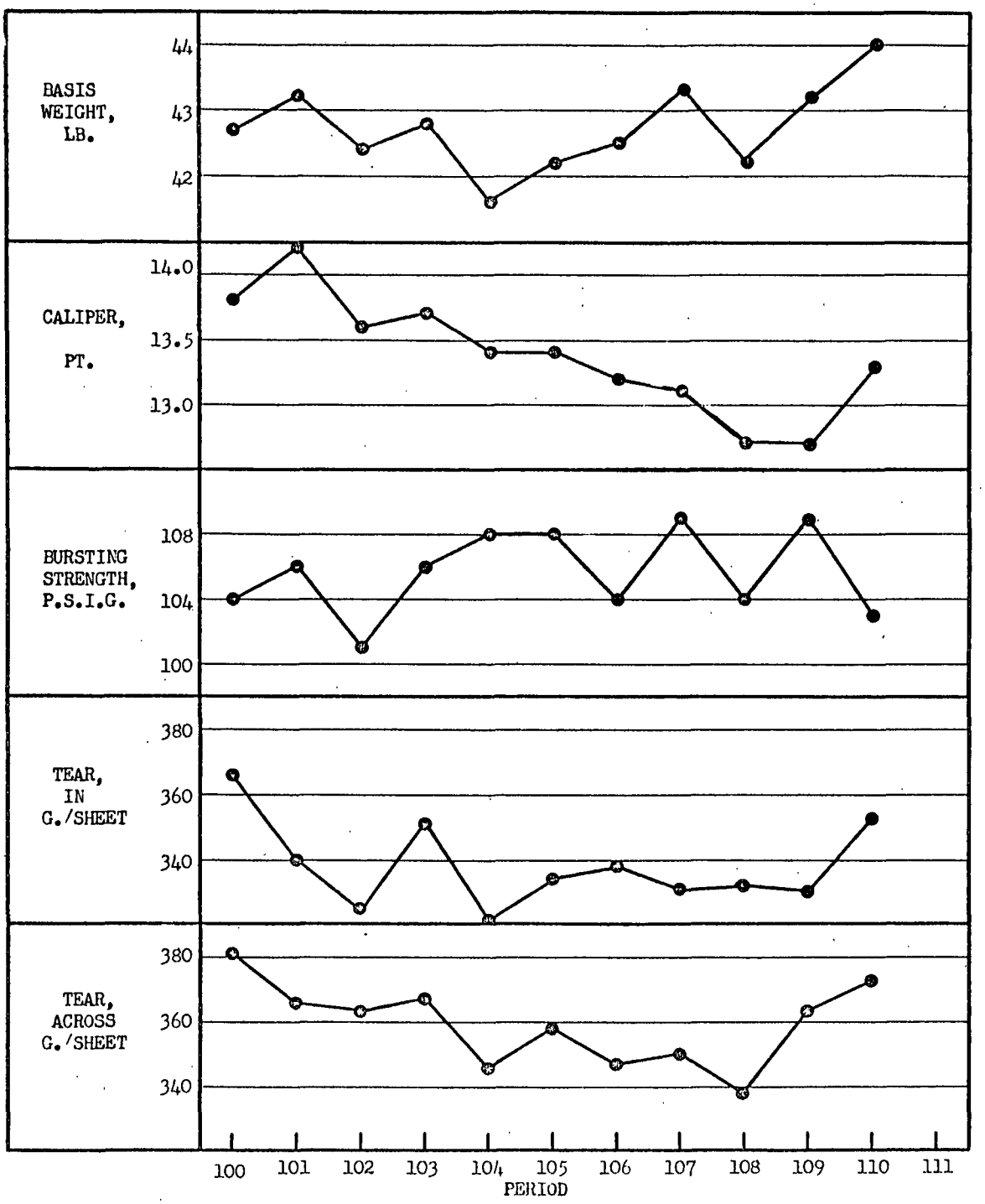


Figure 4

Comparison of Current Mill Averages by Periods for Mill C

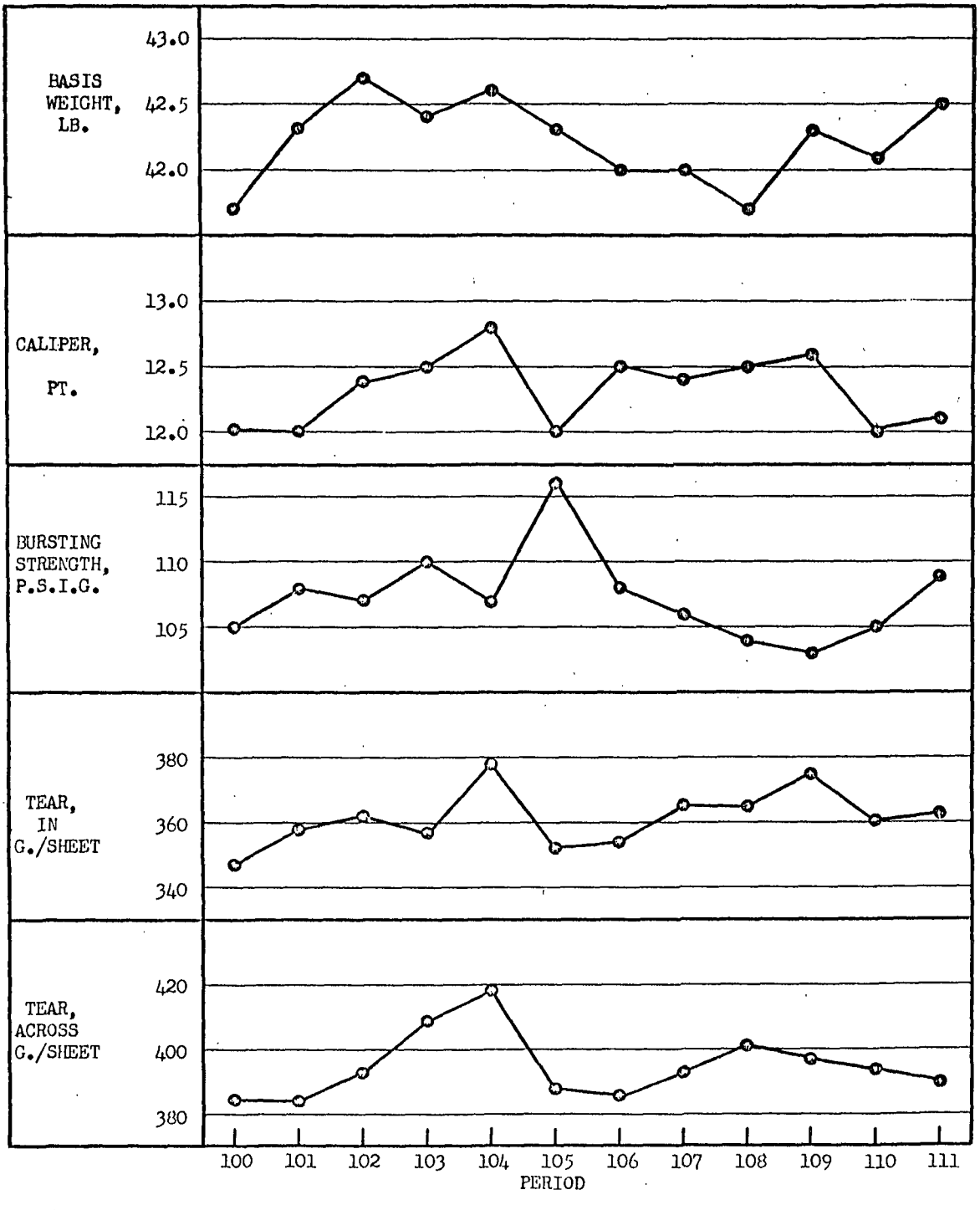


Figure 5

Comparison of Current Mill Averages by Periods for Mill D

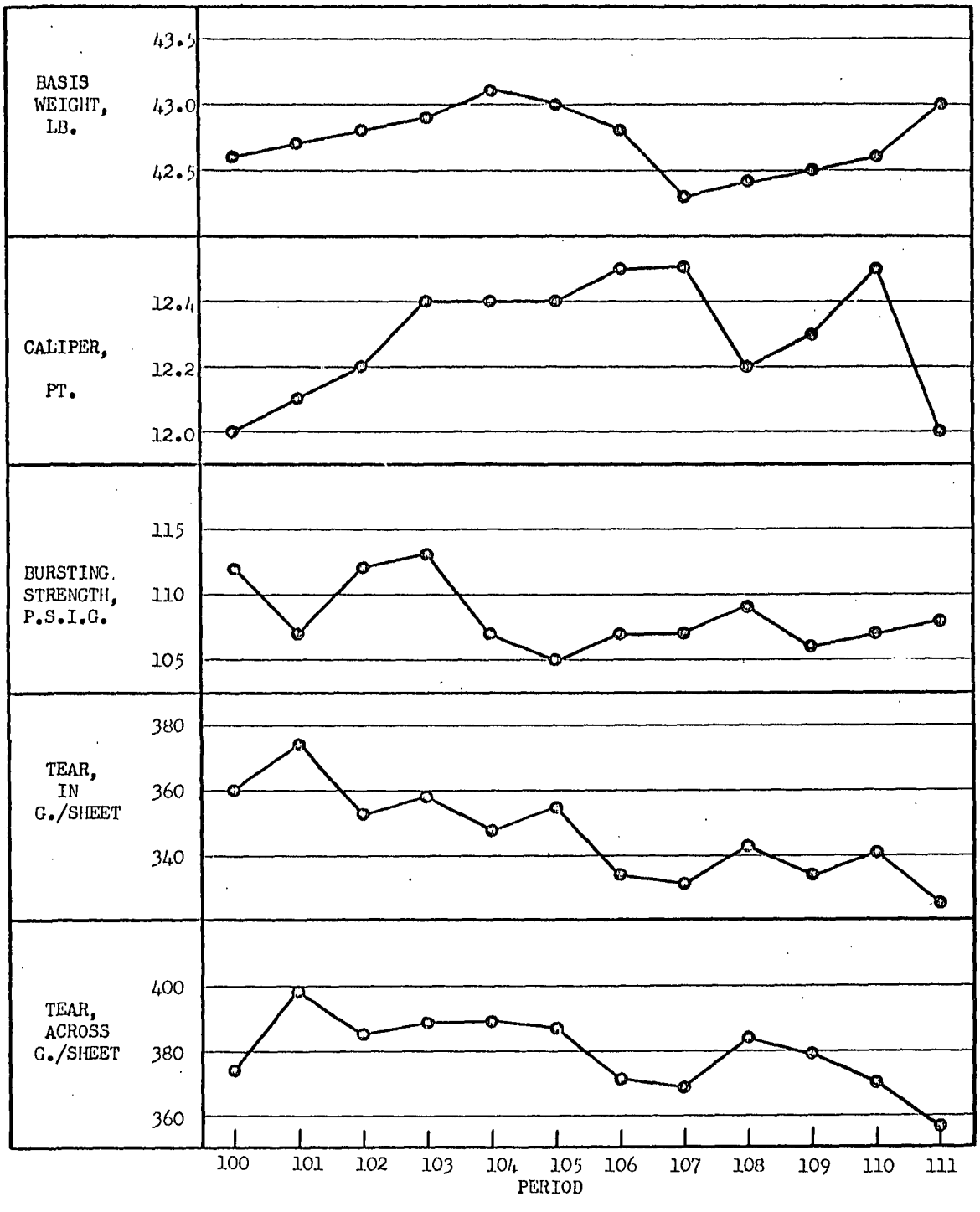


Figure 6

Comparison of Current Mill Averages by Periods for Mill E

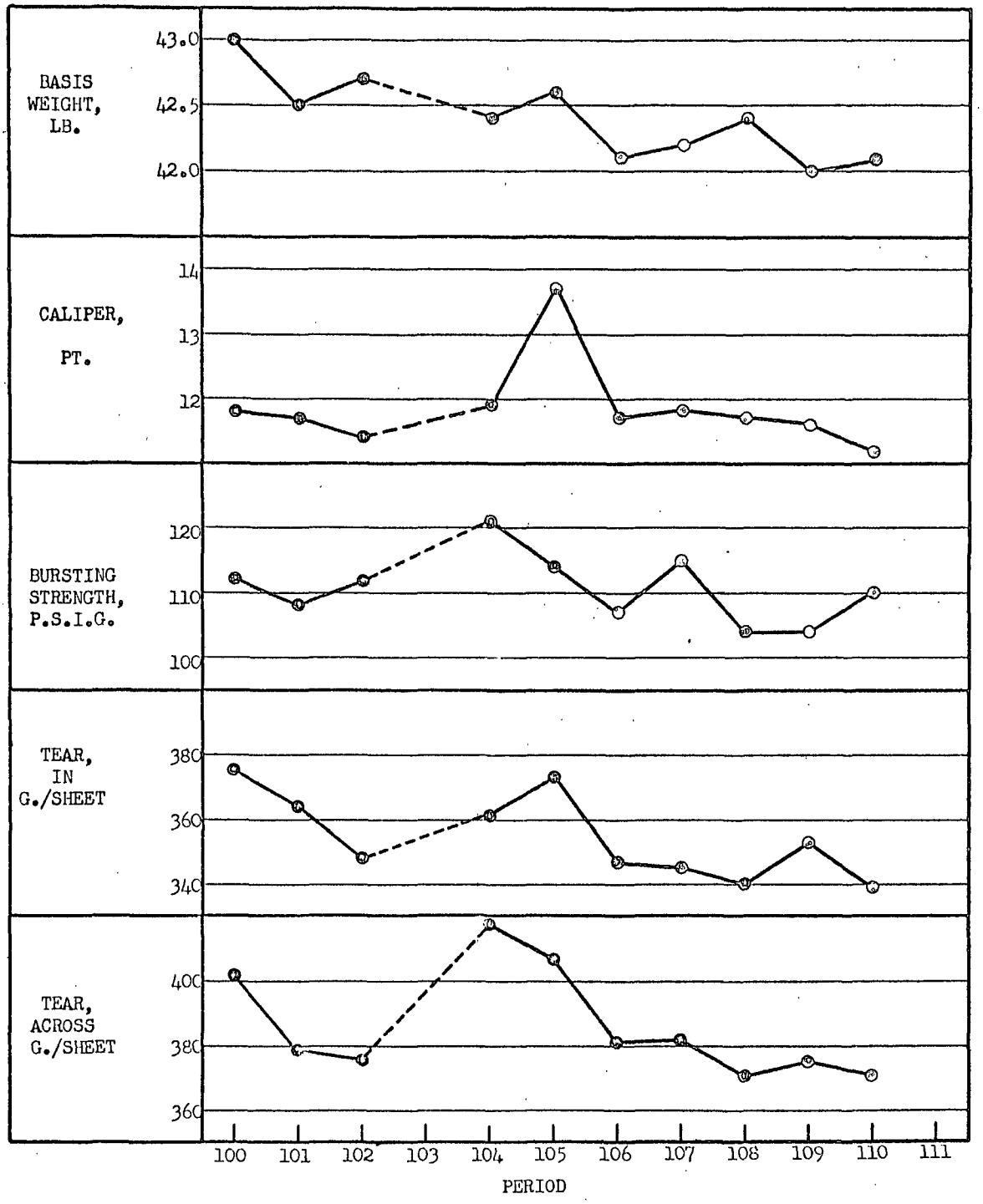


Figure 7

Comparison of Current Mill Averages by Periods for Mill F

Elmendorf tearing strength averages, both machine and cross-machine directions, decreased substantially.

The current mill averages for Mill G are given in Table X and presented graphically in Figure 8. The data plotted in Figure 8 show that basis weight has varied considerably but generally has maintained an average close to the 43-pound level. Caliper has increased whereas bursting strength has decreased along with Elmendorf tearing strength, both directions.

The current mill averages for Mill H, which are given in Table XI and presented graphically in Figure 9, indicate that basis weight averages have remained close to the 43-pound level; caliper has decreased only slightly; bursting strength has held a good level; and Elmendorf tearing strength has decreased in both directions.

In Table XII the current mill averages for Mill I are given, and in Figure 10 these same averages are shown graphically. Basis weight averages have been near the 42.5-pound level for most of the twelve-month period. Caliper averages have varied between 12.7 and 13.5 points. Bursting strength averages have increased to exceptionally strong levels, and Elmendorf tearing strength averages for both directions have decreased.

The current mill averages for Mill J are given in Table XIII and illustrated graphically in Figure 11. An inspection of these data indicates that basis weight, caliper, and Elmendorf tearing strength averages (both directions) have decreased, whereas bursting strength

TABLE X

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL G

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	43.6	12.2	110	367	398
101	42.9	12.0	109	361	390
102	42.4	12.3	108	344	380
103	42.5	12.3	108	348	378
104	43.2	12.6	113	354	392
105	42.9	12.6	109	360	388
106	42.7	12.5	107	349	378
107	42.5	12.6	105	344	370
108	43.2	12.8	108	346	383
109	43.4	12.4	104	342	374
110	42.9	12.8	106	349	376
111	42.4	12.9	105	347	370

514.6
42.88

TABLE XI

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL H

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	43.1	13.3	109	370	392
101	43.3	13.5	107	385	400
102	42.6	13.0	106	350	381
103	43.4	13.3	114	357	394
104	42.9	13.0	115	354	382
105	42.5	12.8	107	346	374
106	43.0	13.2	108	375	388
107	43.1	12.9	107	357	388
108	43.2	13.2	108	359	398
109	43.0	13.2	108	349	375
110	42.9	13.1	113	357	391
111	42.7	13.1	108	349	367

TABLE XII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL I

Period	Basis Weight, lb.	Caliper, Points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	43.0	13.4	106	339	382
101	43.1	13.1	111	339	378
102	43.2	13.5	111	343	378
103	42.6	13.0	111	331	375
104	42.7	13.2	112	330	375
105	42.4	13.3	114	338	371
106	42.6	12.9	122	326	378
107	42.4	12.7	121	314	372
108	42.7	12.8	115	309	384
109	42.5	13.5	113	318	378
110	42.7	13.4	114	328	379
111	42.7	12.8	117	311	373

TABLE XIII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL J

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	44.5	13.6	104	410	415
101	44.3	13.2	102	415	424
102	45.0	13.6	112	406	406
103	43.9	13.6	105	376	382
104	44.0	13.1	100	390	386
105	43.6	13.1	101	411	388
106	44.3	13.0	108	392	396
107	43.0	12.7	103	404	391
108	43.8	13.1	104	393	395
109	43.7	13.1	105	400	408
110	43.3	13.0	102	386	396
111	43.2	12.8	104	381	390

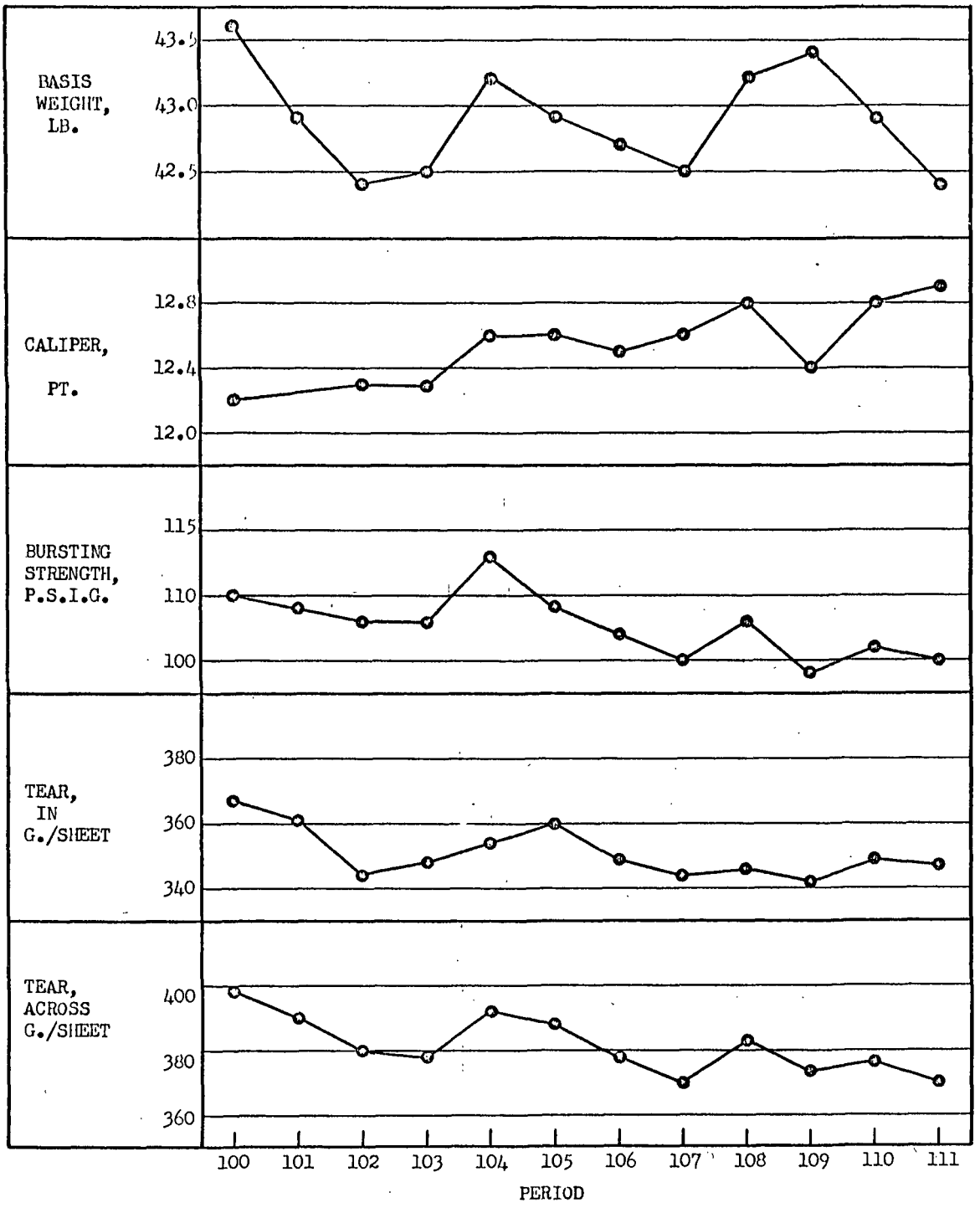


Figure 8

Comparison of Current Mill Averages by Periods for Mill G

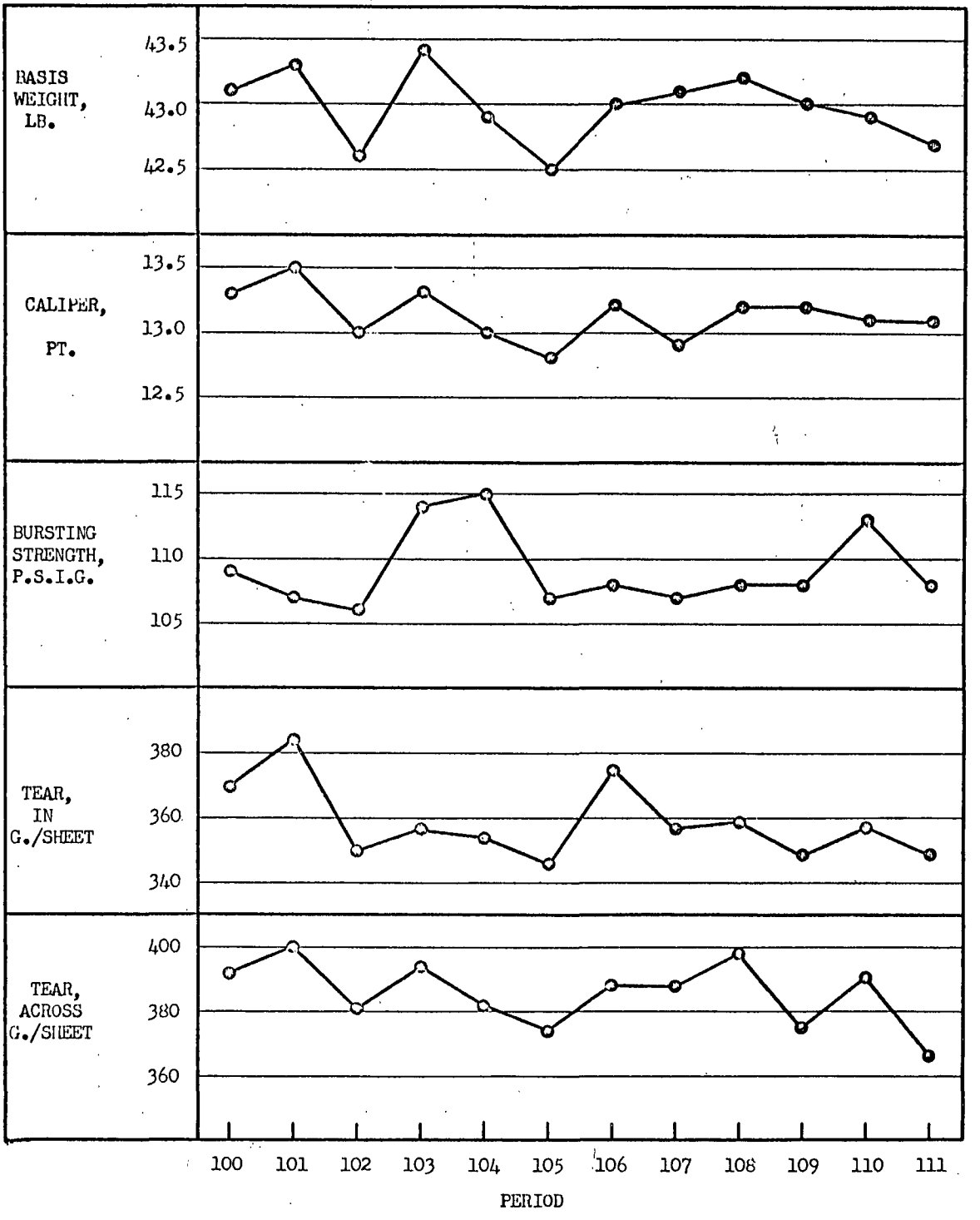


Figure 9

Comparison of Current Mill Averages by Periods for Mill H

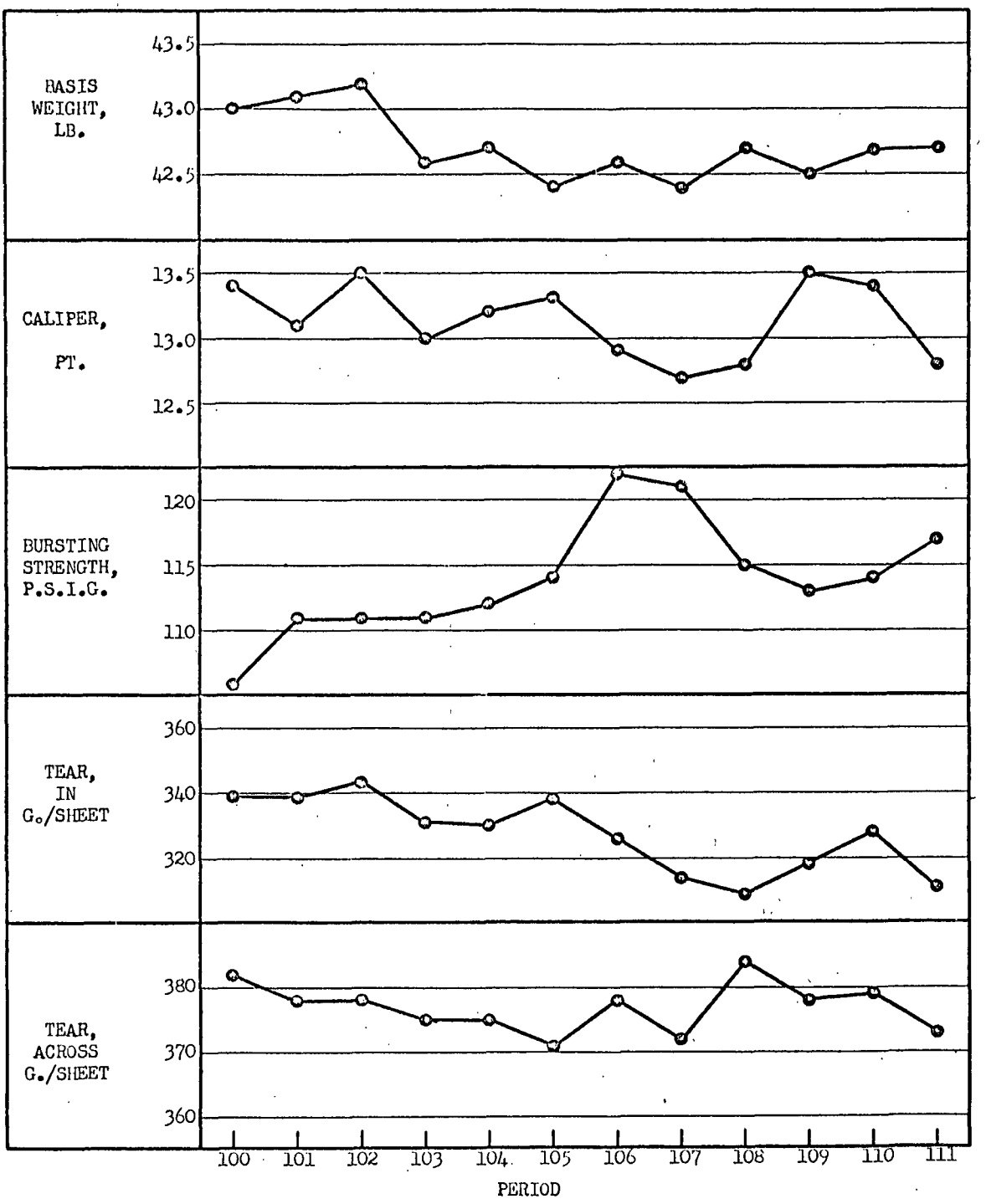


Figure 10

Comparison of Current Mill Averages by Periods for Mill I

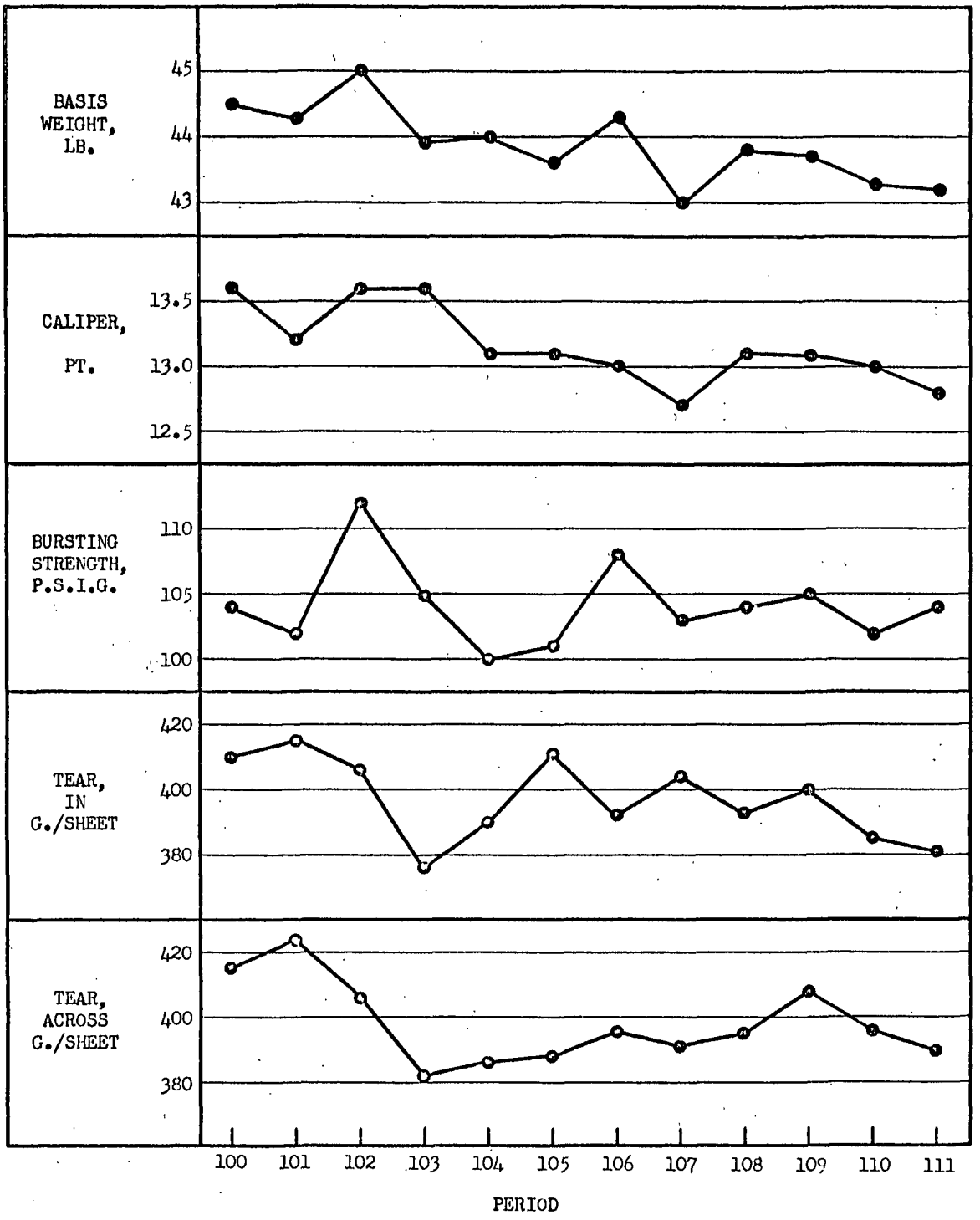


Figure 11

Comparison of Current Mill Averages by Periods for Mill J

averages have maintained a level generally near the 105-p.s.i.g. level.

Graphically illustrated in Figure 12 are the current mill averages given in Table XIV for Mill K. It may be observed in Figure 12 that basis weight averages have varied over a considerable range--from 41.9 pounds to 44.3 pounds, the latter value being the current level. Caliper averages have varied only slightly from a level of 12.5 points. Bursting strength averages have generally been strong but are currently at the lowest levels for the twelve-month period. Elmendorf tearing strength (both directions) averages have decreased.

In Table XV the current mill averages for Mill L are given, and in Figure 13 these averages are presented graphically. It may be seen in Figure 13 that the average basis weight and caliper have increased slightly whereas the average bursting strength has decreased. Contrary to the composite F.K.I. trend, Mill L has maintained a very strong bursting strength level.

The current mill averages for Mill M are given in Table XVI and shown graphically in Figure 14. From the data plotted in Figure 14 it may be seen that basis weight has maintained a high level generally above 43 pounds. The average caliper level has been near 12.5 points. Bursting strength has maintained a strong level of approximately 110 p.s.i.g. Elmendorf tearing strength averages (both directions) have been relatively constant but weak.

TABLE XIV

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL K

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	42.8	12.3	105	354	361
101	42.8	12.8	109	374	374
102	43.2	12.4	111	359	372
103	42.8	12.8	107	367	366
104	43.4	12.8	108	384	373
105	42.7	12.9	111	373	372
106	42.3	12.6	103	344	352
107	41.9	12.2	109	338	337
108	42.6	12.9	107	361	358
109	42.2	12.6	108	347	352
110	42.7	12.6	111	343	355
111	44.3	12.7	101	352	357

TABLE XV

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL L

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	42.3	11.9	108	377	409
101	41.2	11.6	106	349	371
102	42.1	11.6	107	376	404
103	42.6	11.7	105	374	415
104	42.8	11.9	103	380	421
105	42.4	11.9	108	372	408
106	43.0	12.1	101	394	408
107	43.6	12.4	100	383	413
108	43.0	12.4	100	385	419
109	42.4	12.0	101	374	399
110	43.4	12.3	103	374	404
111	42.9	12.2	102	365	409

511.7

42.64

TABLE XVI

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL M

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	43.3	12.7	107	330	366
101	43.8	12.7	109	341	391
102	43.7	12.2	117	325	394
103	43.1	12.4	110	315	369
104	42.5	12.5	109	317	364
105	43.0	12.7	113	336	384
106	42.5	12.6	111	331	376
107	43.1	12.0	109	334	368
108	44.1	12.7	110	333	373
109	43.8	12.4	110	329	374
110	43.1	12.6	111	333	382
111	43.1	12.8	108	326	374

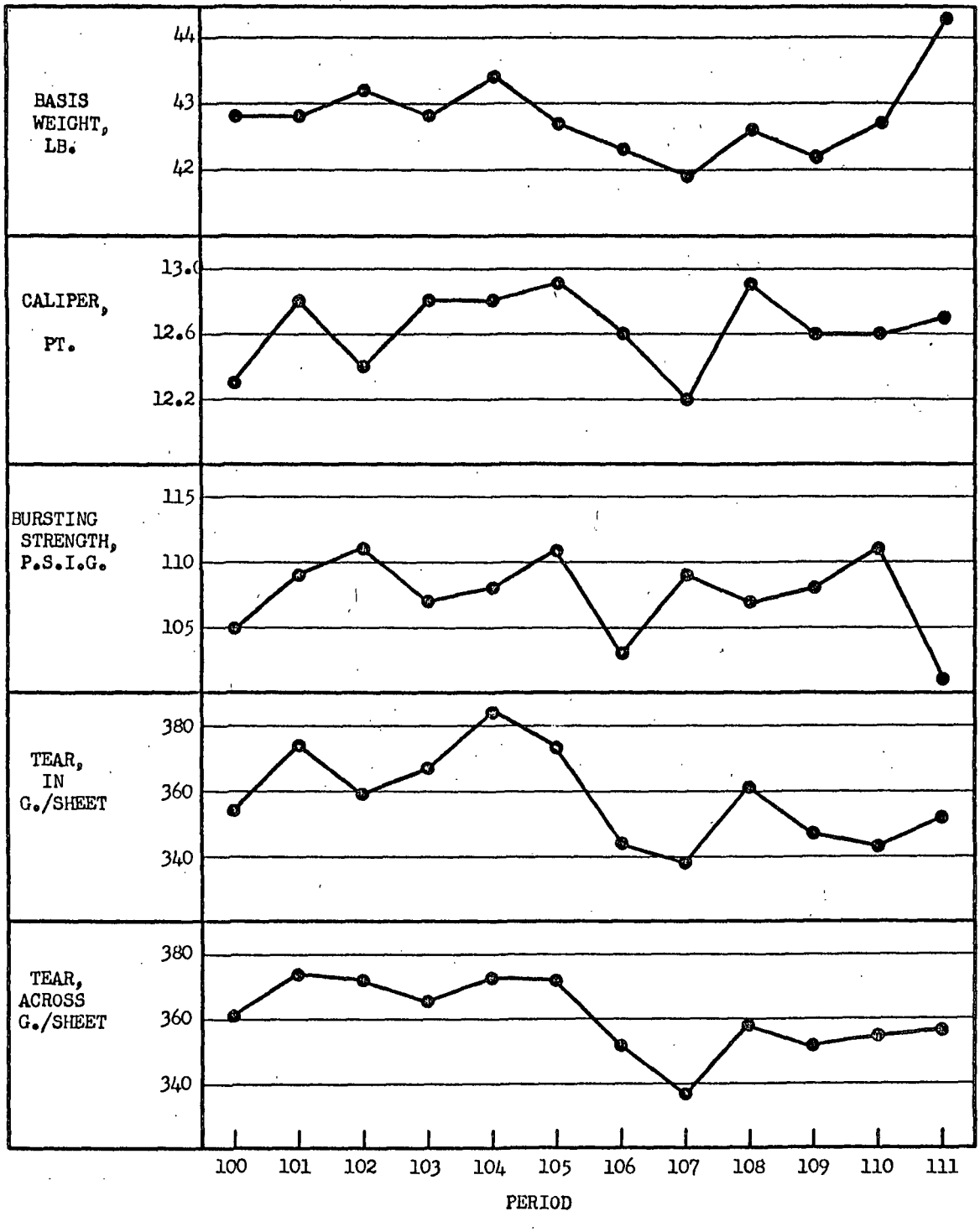


Figure 12

Comparison of Current Mill Averages by Periods for Mill K

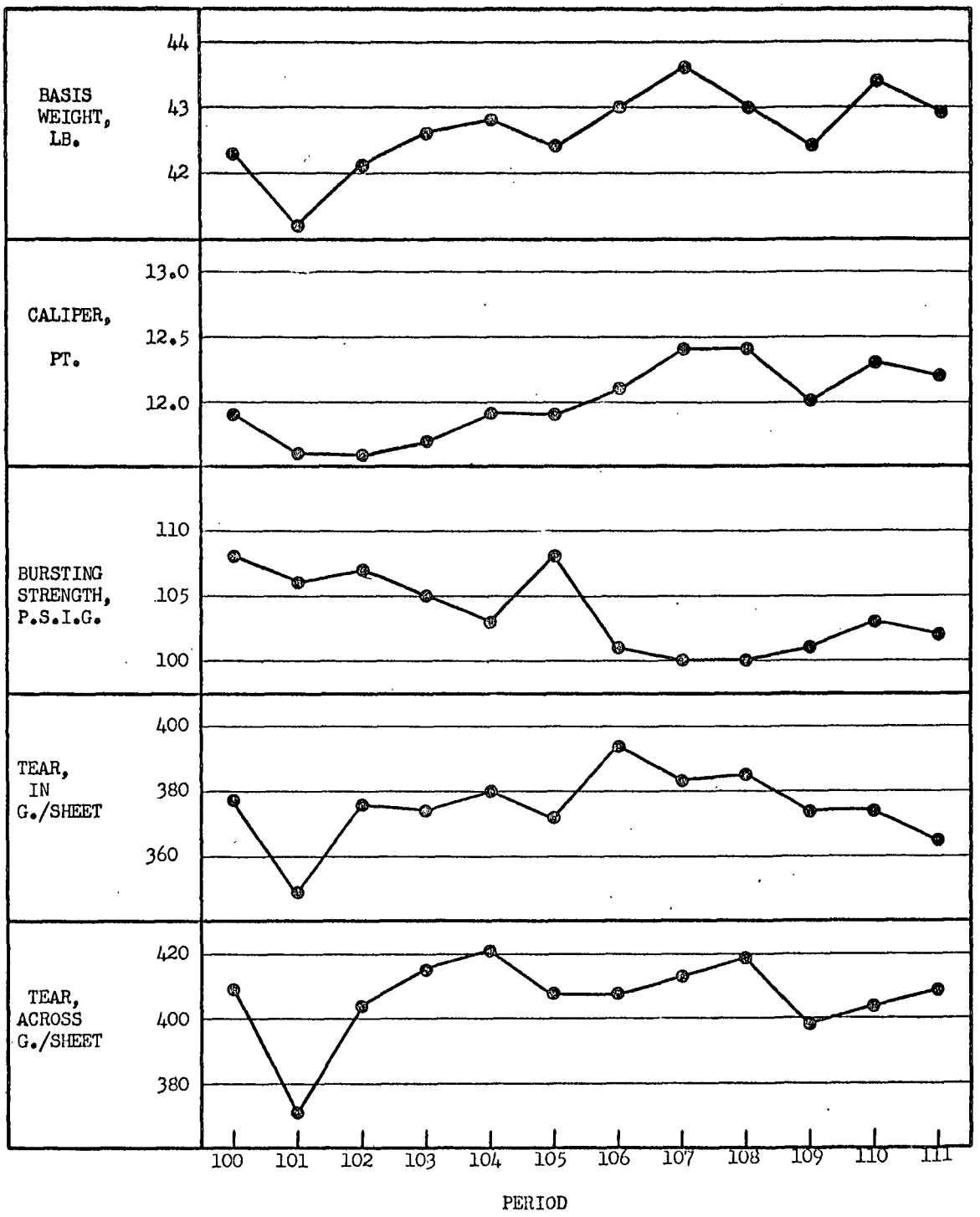


Figure 13

Comparison of Current Mill Averages by Periods for Mill L

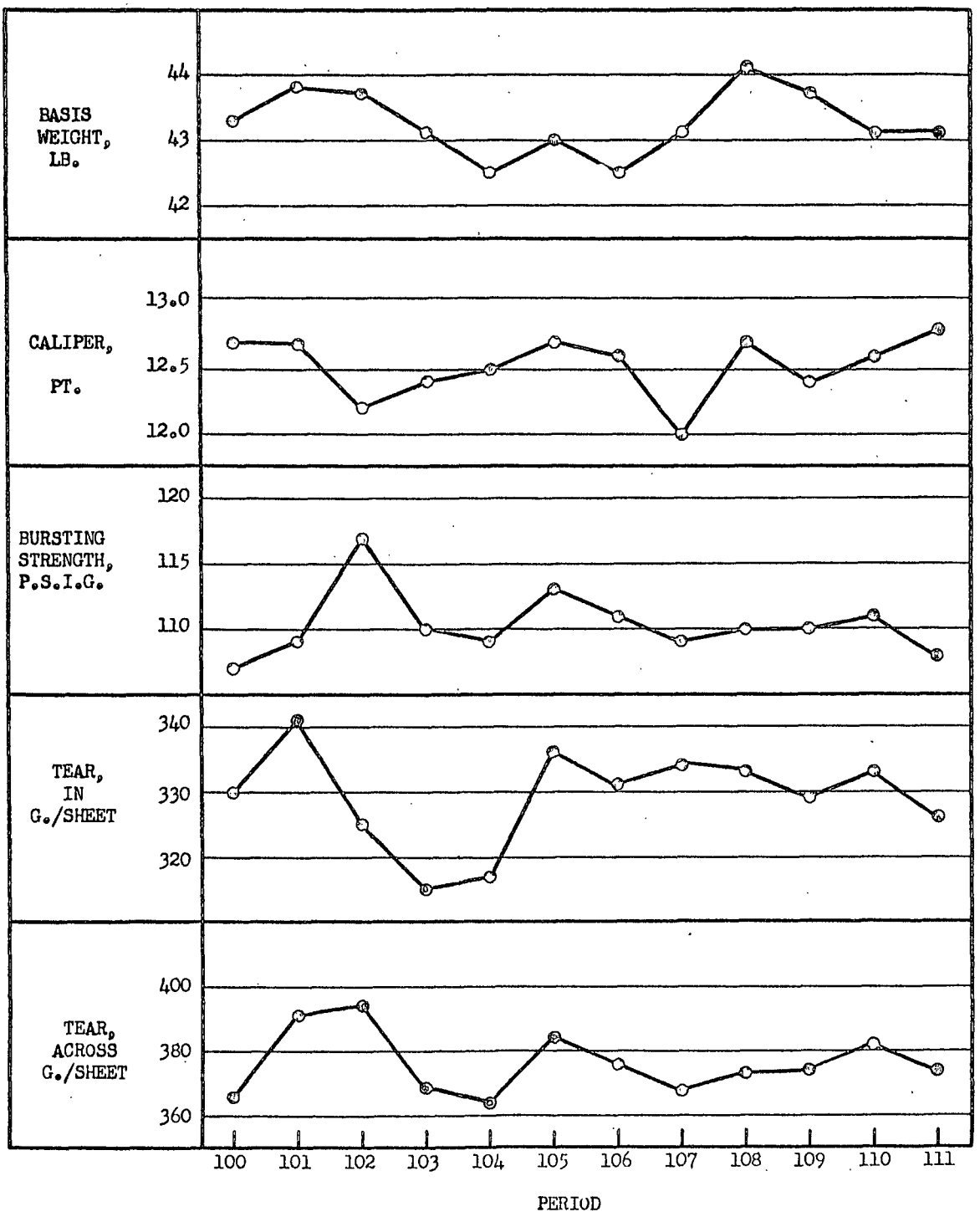


Figure 14

Comparison of Current Mill Averages by Periods for Mill M

Presented graphically in Figure 15 are the current mill averages for Mill N. These averages are also given in Table XVII. An inspection of Figure 15 reveals that none of the tests gives evidence of any well-grounded trend. Basis weight was generally near 43-pounds, caliper near 12.4 points, bursting strength near 108 p.s.i.g., and machine and cross-machine direction Elemendorf tearing strength near 320 and 360 g./sheet, respectively.

In Table XVIII the current mill averages for Mill O are presented. These averages are shown graphically in Figure 16. It may be observed from an inspection of Figure 16 and Table XVIII that basis weight has maintained a level above 43 pounds; caliper has varied from a high of 13.0 points to a low of 12.3 points; bursting strength has maintained an average near 110 p.s.i. g.; and Elmendorf tearing strength has decreased in both directions.

The current mill averages for Mill P are shown in Table XIX and illustrated graphically in Figure 17. A study of Figure 17 reveals that basis weight averages have remained steady above the 43-pound level. Caliper averages have fluctuated considerably and are currently at the lowest level for the twelve-month period. Bursting strength averages have increased substantially whereas Elmendorf tearing strength averages have decreased slightly.

Shown in Table XX are the current mill averages for Mill Q. A graphic presentation of these averages is made in Figure 18. An

TABLE XVII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL N

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	42.3	12.2	107	292	348
101	43.2	12.1	105	321	364
102	42.9	12.1	106	307	364
103	43.1	12.5	108	316	381
104	42.7	12.6	107	317	379
105	42.5	12.3	108	297	367
106	42.3	12.3	107	303	370
107	43.2	12.5	110	315	378
108	42.8	12.3	110	295	360
109	42.5	12.1	108	305	366
110	42.8	12.3	104	330	368
111	43.6	12.4	108	344	382

TABLE XVIII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL O

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	43.3	12.5	109	354	384
101	43.4	12.7	112	351	395
102	43.0	13.0	109	353	386
103	43.3	12.8	111	343	382
104	42.5	12.9	108	355	385
105	43.6	12.5	111	361	397
106	43.7	12.4	109	359	385
107	43.6	12.3	110	350	383
108	44.1	12.5	110	369	389
109	42.7	12.3	110	346	366
110	43.4	12.5	111	352	374
111	43.4	12.9	112	334	369

TABLE XIX

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL P

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet In	Across
100	44.0	14.1	102	335	367
101	42.5	13.3	104	321	353
102	43.6	13.8	99	342	369
103	43.1	13.4	102	321	355
104	42.8	13.6	104	321	362
105	43.3	13.5	107	318	353
106	43.5	13.5	109	325	358
107	43.5	13.4	108	328	363
108	43.3	13.7	107	318	355
109	43.5	14.0	106	335	374
110	43.1	13.6	111	331	366
111	43.3	13.2	112	316	353

TABLE XX

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL Q

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	43.4	12.2	114	323	365
101	43.8	12.6	118	328	376
102	42.7	11.8	118	303	355
103	42.6	11.9	119	307	354
104	42.7	11.9	118	312	365
105	43.0	12.0	117	317	369
106	43.9	13.3	109	330	376
107	43.2	12.4	114	312	371
108	42.4	13.1	107	320	341
109	42.7	13.1	106	316	360
110	43.1	13.1	116	307	354
111	43.5	12.6	114	283	338

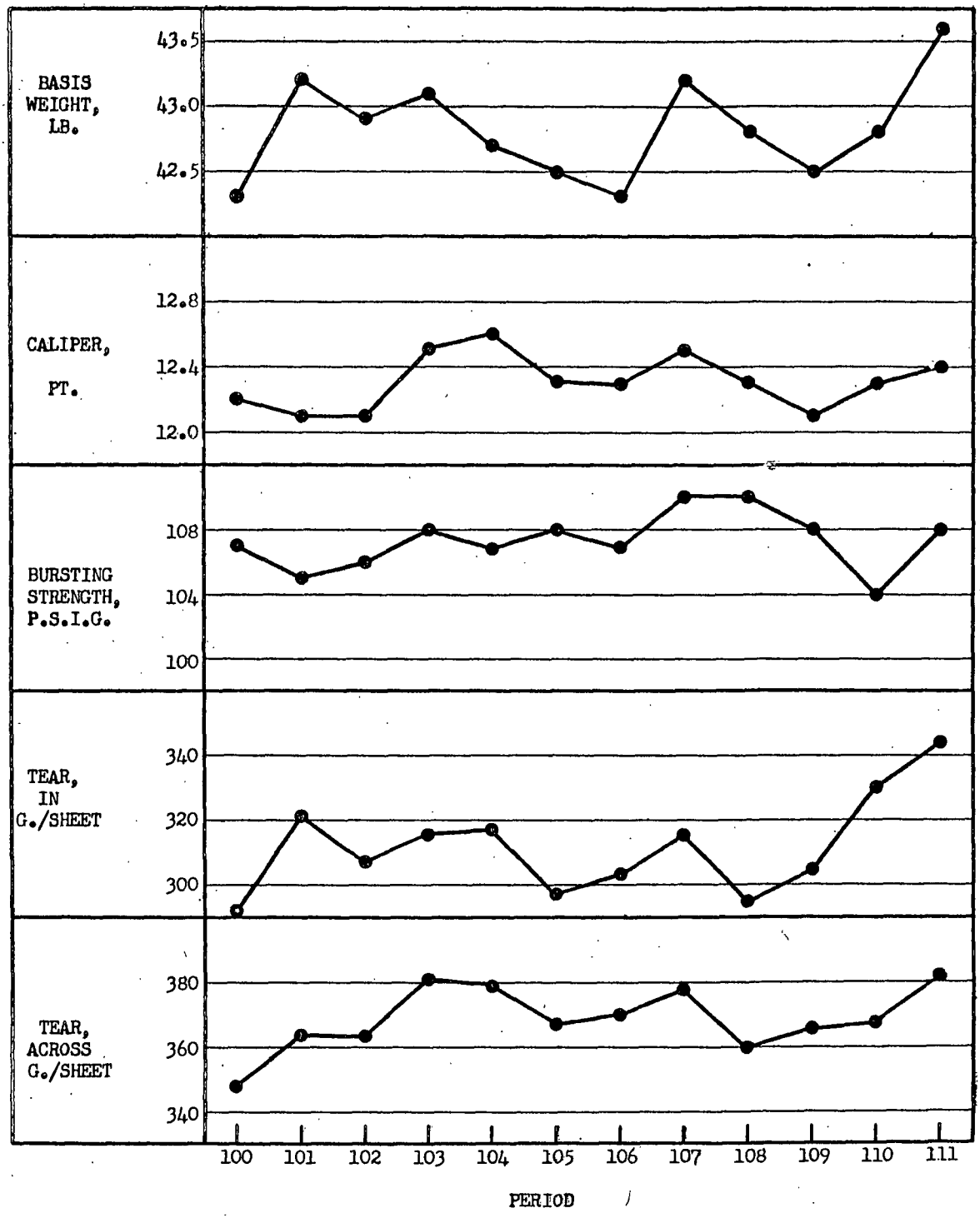


Figure 15

Comparison of Current Mill Averages by Periods for Mill N

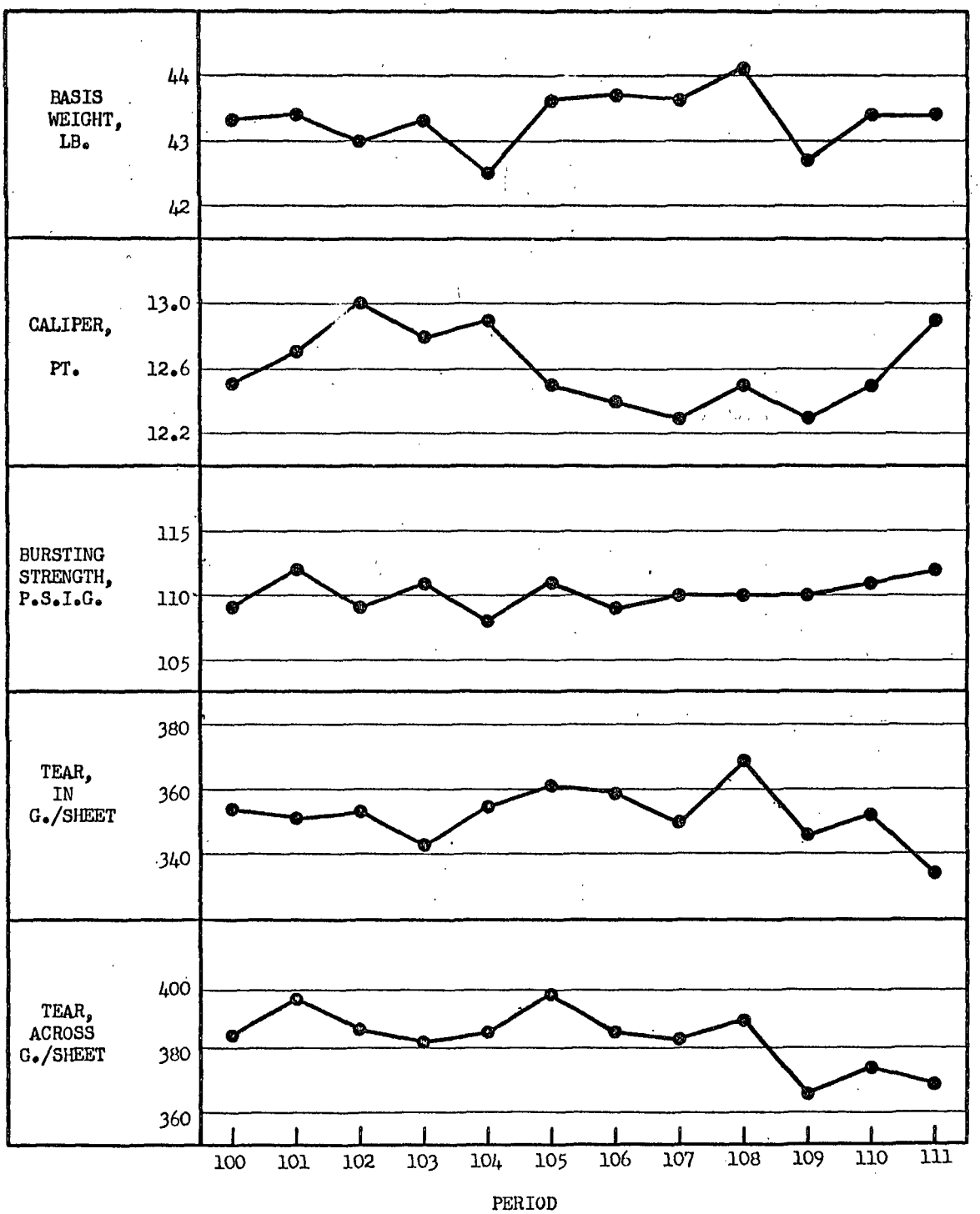


Figure 16

Comparison of Current Mill Averages by Periods for Mill O

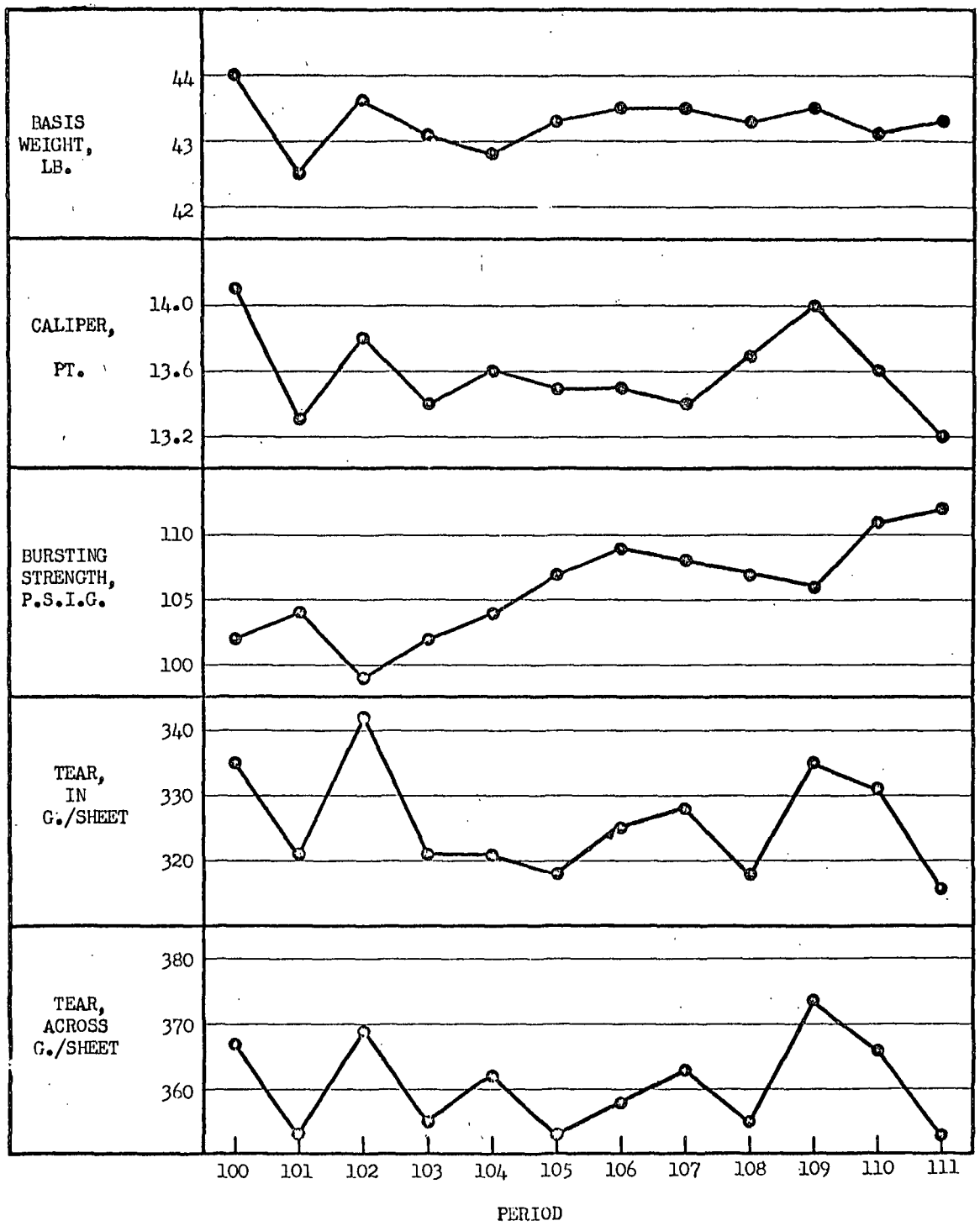


Figure 17

Comparison of Current Mill Averages by Periods for Mill P

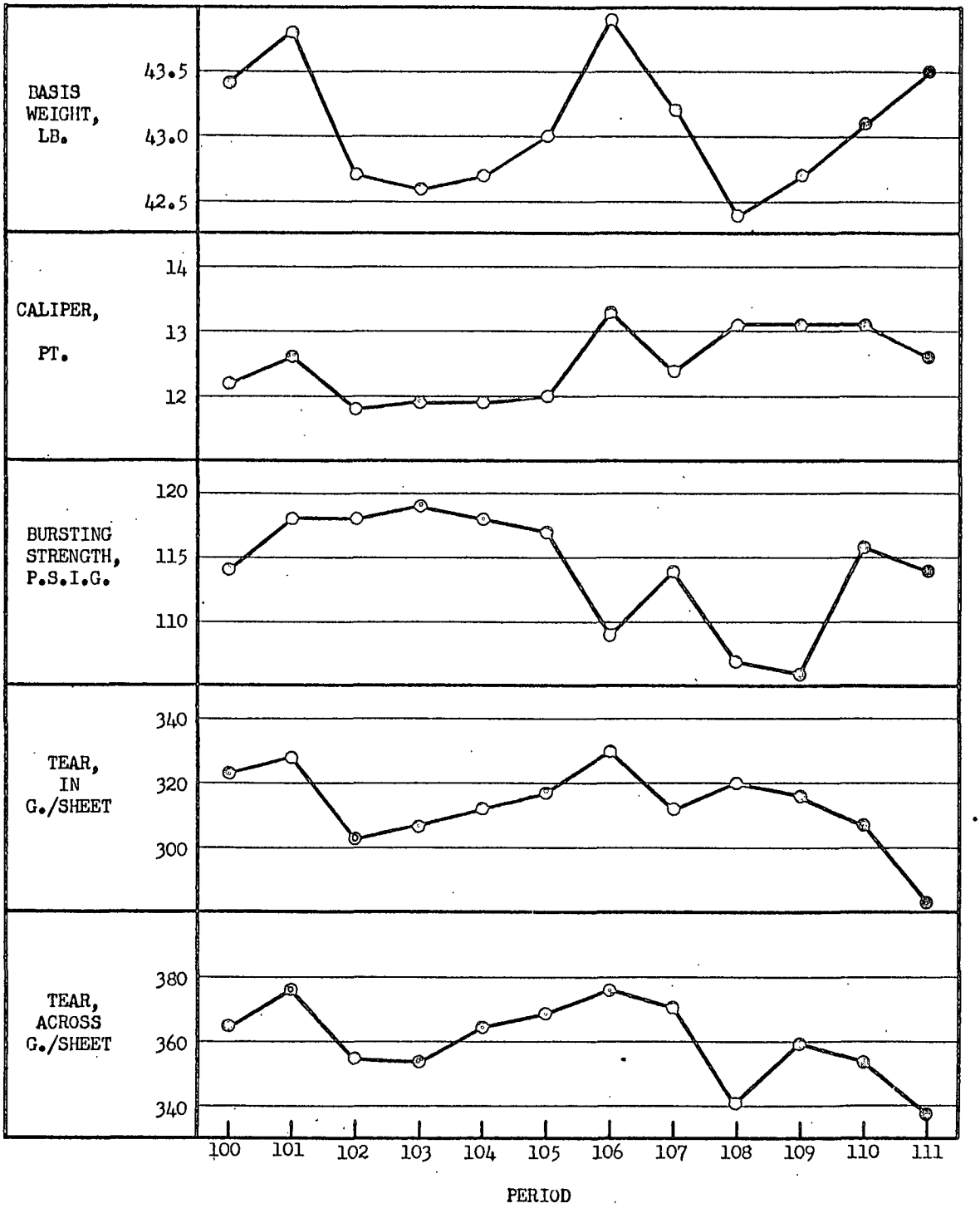


Figure 18

Comparison of Current Mill Averages by Periods for Mill Q

inspection of these data indicates no trend for basis weight which appears to vary randomly above and below the 43-pound level. Caliper averages appear to have increased whereas bursting strength averages are currently at a high level after hitting a low level for several periods. Both machine and cross-machine direction Elmendorf tearing strength results have decreased to very weak levels.

Mill S's current averages are given in Table XXI and presented graphically in Figure 19. Mill S shows the following trends: relatively constant weight and caliper, lower bursting strength, and lower Elmendorf tearing strength, both directions.

The current mill averages for the drum linerboard samples submitted by Mill R are given in Table XXII and presented graphically in Figure 20. A trend to higher weight is the only one evident.

A composite summary of the current F.K.I. averages from the inception of the Continuous Baseline Study to the present time is given in Table XXIII. These results are illustrated graphically in Figure 21. It may be noted in Figure 21 that basis weight has remained relatively constant, being near the 43-lb. level at all times. A very definite trend to lower caliper has been evident and, at the present time, caliper values have leveled off at slightly below 13 points. Bursting strength values for the one hundred and eleven periods have exhibited no constant long-range trend. During the first thirty-six periods, bursting strength showed an upward trend; then, to period forty-three, a downward trend.

TABLE XXI

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL S

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i.g.	Elmendorf Tear, g./sheet In	Across
100	43.6	12.5	118	334	391
101	44.0	12.7	115	339	397
102	43.6	12.4	114	332	383
103	43.1	12.4	112	321	373
104	43.3	12.6	109	321	375
105	43.0	12.6	111	322	368
106	43.0	12.5	109	318	364
107	43.0	12.4	110	311	352
108	43.5	12.4	106	313	354
109	43.3	12.3	108	322	360
110	43.3	12.3	107	314	353
111	43.4	12.7	107	307	352

TABLE XXII

TABULATION OF CURRENT AVERAGES BY PERIODS FOR MILL R
(Drum Linerboard)

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	Elmendorf Tear, g./sheet	
				In	Across
100	45.9	13.8	100	374	399
101	--	--	--	--	--
102	46.7	14.4	88	409	374
103	47.4	14.1	94	353	372
104	46.8	14.3	104	405	426
105	47.0	14.3	97	384	369
106	--	--	--	--	--
107	46.8	13.8	98	391	371
108	48.5	14.7	107	385	410
109	47.3	13.8	92	371	369
110	47.4	14.1	98	398	392
111	48.5	14.0	94	376	393

TABLE XXIII

TABULATION OF CURRENT F.K.I. AVERAGES BY PERIODS

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	G. E. Puncture, units	Elmendorf Tear, g./sheet In	Across
1	42.9	15.6	103	40	389	422
2	42.6	15.3	102	39	373	408
3	43.1	15.4	105	39	395	423
4	43.4	15.2	107	39	381	412
5	43.2	15.4	104	39	378	419
6	43.1	15.2	101	39	377	416
7	43.4	15.4	99	39	384	411
8	42.9	14.9	102	39	383	409
9	43.2	15.0	101	40	387	416
10	43.4	15.0	101	37	403	426
11	43.2	14.7	104	38	400	423
12	43.0	14.6	103	37	394	423
13	42.9	14.5	102	38	379	416
14	43.0	14.5	102	37	379	411
15	43.0	14.5	105	34	372	409
16	43.3	14.8	104	34	370	400
17	43.1	14.9	105	36	372	408
18	43.5	14.8	104	36	374	411
19	43.3	14.6	105	38	364	401
20	43.2	14.2	106	37	372	406
21	43.4	14.1	109	37	376	415
22	43.0	14.1	113	37	381	414
23	43.3	14.1	110	37	377	410
24	43.5	14.1	110	36	379	405
25	43.5	14.4	109	35	382	414
26	43.4	14.2	110	36	374	404
27	43.4	14.0	112	37	385	425
28	43.4	14.1	111	37	388	417
29	42.9	14.0	109	36	379	415
30	43.1	13.7	108	36	383	425
31	43.0	13.6	106	36	384	418
32	42.6	13.6	106	36	390	418
33	43.6	13.7	110	36	376	413
34	43.5	13.5	110	36	379	410
35	43.3	13.4	109	36	374	414
36	43.2	13.4	110	36	372	411
37	43.3	13.7	107	35	379	412
38	43.0	13.7	106	35	372	411
39	42.9	13.6	105	35	369	402
40	42.9	13.8	104	36	379	412

TABLE XXIII--Continued

TABULATION OF CURRENT F.K.I. AVERAGES BY PERIODS

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	G. E. Puncture, units	Elmendorf Tear, g./sheet In	Elmendorf Tear, g./sheet Across
41	42.9	13.4	102	34	371	403
42	42.9	13.3	102	35	374	408
43	42.6	13.4	102	36	373	401
44	42.5	13.4	104	35	357	390
45	42.7	13.3	105	35	362	395
46	42.4	13.2	105	35	359	393
47	42.6	13.4	104	35	365	399
48	42.6	13.3	103	36	367	397
49	42.8	13.3	104	35	362	397
50	42.9	13.2	108	35	362	389
51	42.8	13.3	106	35	363	393
52	42.9	13.2	106	36	367	395
53	42.9	13.2	109	34	357	391
54	43.2	13.4	106	36	362	398
55	42.9	13.4	106	35	365	398
56	43.0	13.4	108	36	358	394
57	43.1	13.3	107	35	359	388
58	42.7	13.3	108	35	348	382
59	42.9	13.4	109	35	354	390
60	43.1	13.3	107	34	360	388
61	43.3	13.4	108	35	363	400
62	43.2	13.3	109	34	364	390
63	43.1	13.5	107	34	356	390
64	42.9	13.5	107	34	353	391
65	42.9	13.4	108	35	364	400
66	43.0	13.2	108	34	360	394
67	43.0	13.1	108	34	353	390
68	42.9	13.3	109	34	350	388
69	43.0	13.2	110	35	363	397
70	43.0	13.4	108	34	358	390
71	43.2	13.4	110	35	364	399
72	43.0	13.1	108	33	351	387
73	42.9	12.9	111	33	349	385
74	43.1	13.0	110	33	347	382
75	42.7	12.8	112	33	341	374
76	43.0	13.2	107	33	342	375
77	42.9	13.0	109	33	347	380
78	43.4	13.1	109	33	353	387
79	43.0	13.0	108	34	351	384
80	43.1	13.0	108	35	348	384

TABLE XXIII--Continued

TABULATION OF CURRENT F.K.I. AVERAGES BY PERIODS

Period	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. g.	G. E. Puncture, units	Elmendorf Tear, g./sheet In	Across
81	42.9	13.0	110	34	356	389
82	43.0	12.9	109	34	354	383
83	43.0	13.1	111	34	351	381
84	42.7	12.9	111	33	344	377
85	43.1	12.9	114	34	352	383
86	42.9	12.8	112	34	351	378
87	42.9	12.8	112	34	347	379
88	43.1	13.0	111	35	355	382
89	43.0	13.1	109	36	361	389
90	43.4	13.0	110	37	355	384
91	42.9	12.9	111	36	355	384
92	43.2	13.0	110	35	347	377
93	43.3	13.0	112	37	358	387
94	43.0	12.8	111	36	360	387
95	42.9	12.7	110	36	362	387
96	42.8	12.6	108	35	351	383
97	43.0	12.7	109	35	358	388
98	42.8	12.7	111	35	353	385
99	42.7	12.6	109	35	352	381
100	43.0	12.7	108		352	382
101	43.0	12.7	108		352	383
102	43.0	12.6	109		345	379
103	43.0	12.8	109		342	379
104	42.8	12.8	109		345	382
105	42.8	12.8	110		347	379
106	43.0	12.7	109		343	375
107	42.9	12.6	109		341	374
108	43.0	12.7	107		343	375
109	42.9	12.7	107		342	375
110	43.0	12.7	109		340	372
111	43.2	12.7	108		333	368

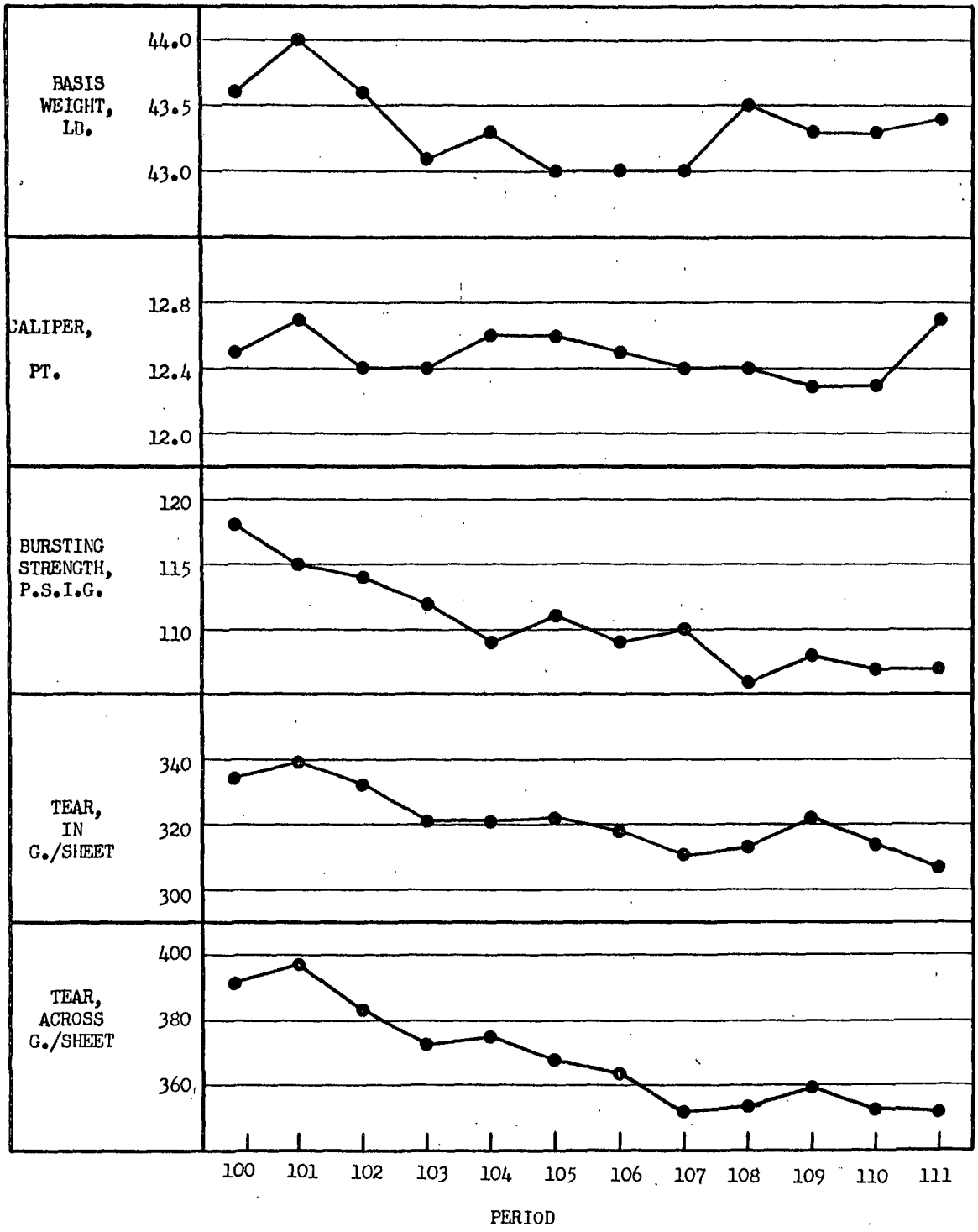


Figure 19

Comparison of Current Mill Averages by Periods for Mill S

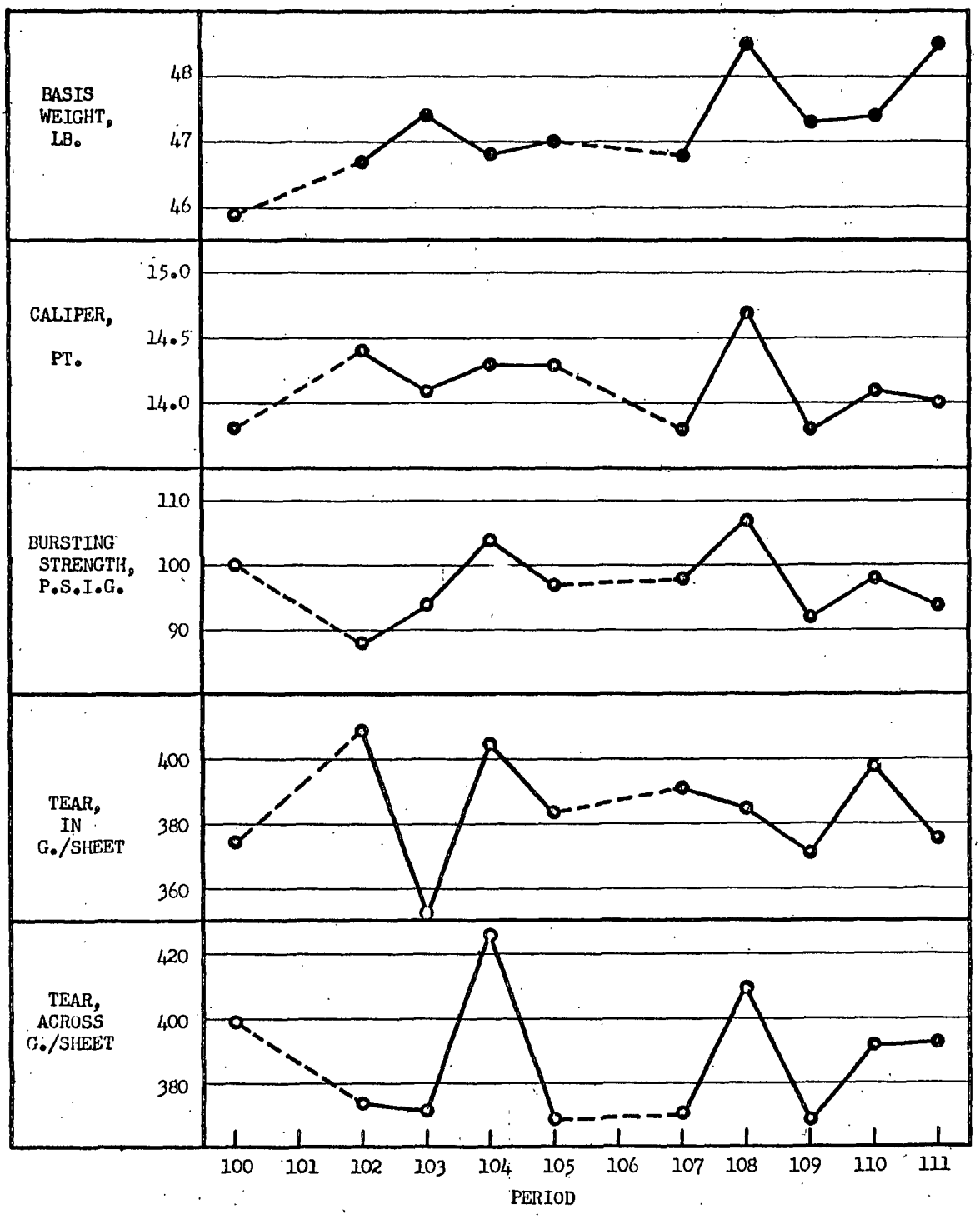
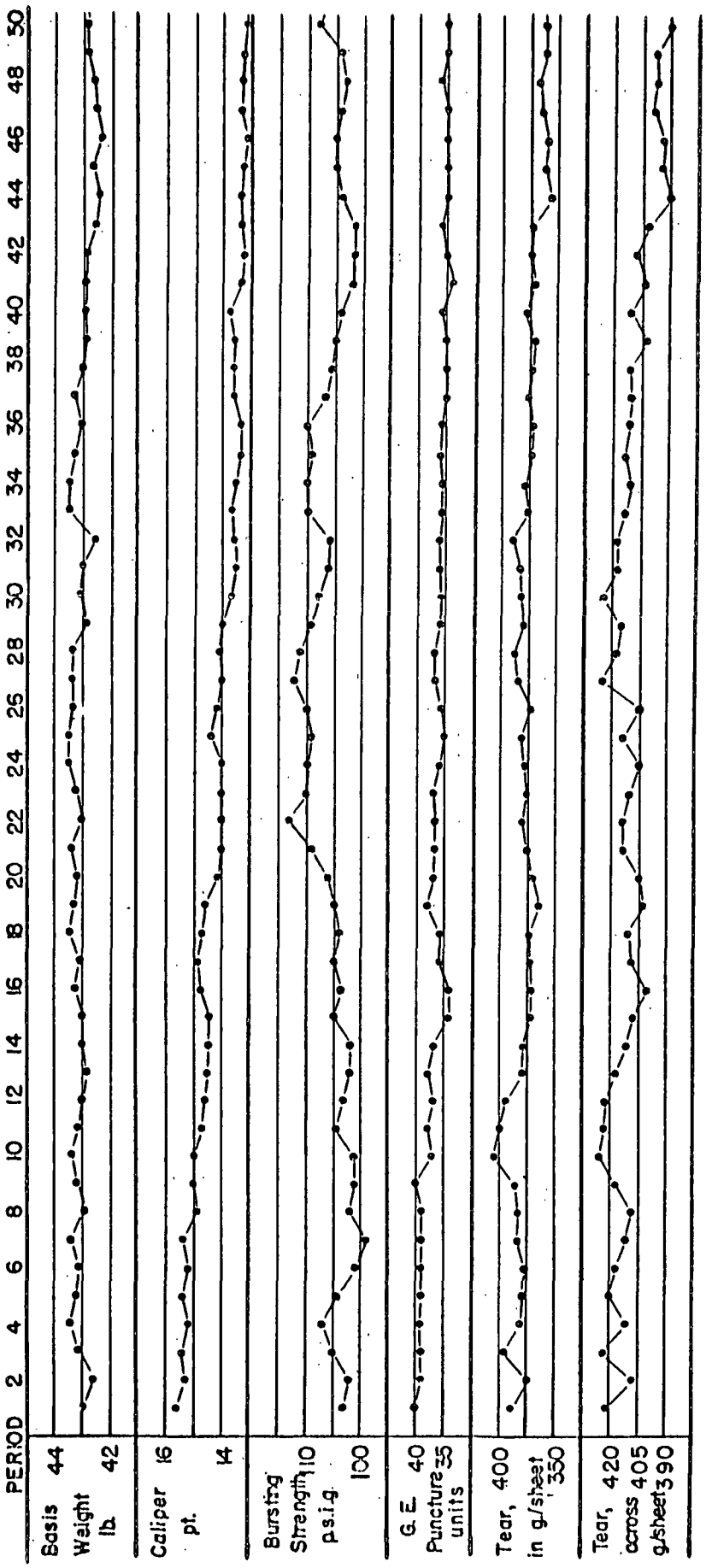


Figure 20

Comparison of Current Mill Averages by Periods for Mill R
(Drum Linerboard)



COMPARISON OF CURRENT F.K.I. AVERAGES BY PERIODS

Figure 21

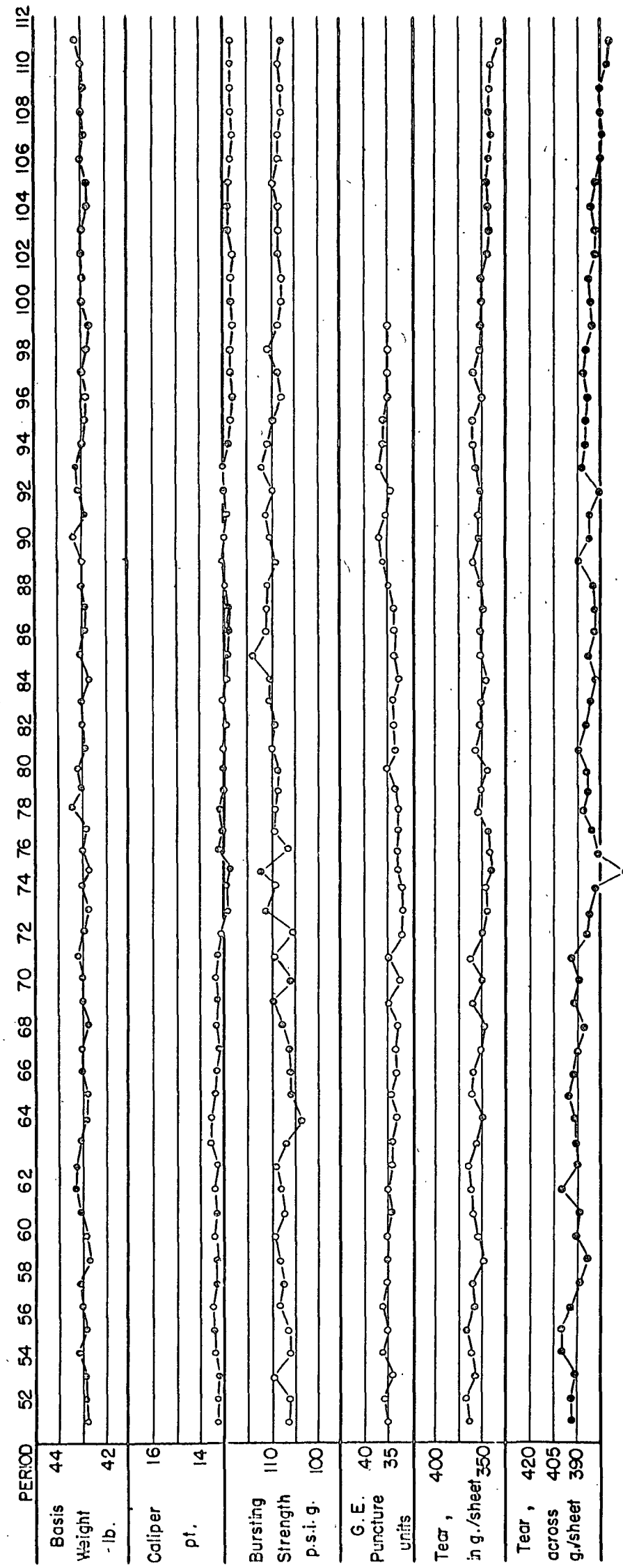


Figure 21 (Continued)

Since then, the bursting strength has maintained a high level near 110 p.s.i. g. G. E. puncture values have exhibited a gradual decline but appeared to be gaining strength when the test was discontinued at the conclusion of period 99. The machine and cross-machine direction tearing strength values have also gradually declined since the study was initiated. Thus, briefly summarized, the trends for the one hundred and eleven periods have been the following:

1. Weight has remained relatively constant at approximately 43 lb.

2. Caliper has decreased from a high level of nearly 16 points and leveled off at slightly below 13 points.

3. Bursting strength has exhibited upward and downward trends, and is currently maintaining a high level near 110 p.s.i.g.

4. G. E. puncture has gradually declined from a high of 40 units for the first period to a low of 33 units for the 72nd to 78th periods but appeared to be regaining strength when the test was discontinued at the conclusion of the 99th period.

5. Machine direction tearing strength has declined from 400 g./sheet at the start of the program to about 330 g./sheet currently.

6. Cross-machine direction tearing strength has slowly declined from a high value of more than 420 g./sheet at the inception of the study to approximately 365 g./sheet at the present time.